

# NETWORK WORLD

## The Newsweekly of User Networking Strategies

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## Cisco turns AGS line into SNA routers

By Paul Desmond  
Senior Editor

WASHINGTON, D.C. — Cisco Systems, Inc. last week said it is teaming up with a third-party software firm to enable its AGS bridge/routers to emulate IBM front-end processors and route SNA data.

The ability to emulate a front-end processor will enable Cisco Systems' bridge/routers to poll devices, such as cluster controllers, and ship Systems Network Architecture packets to the appropriate destination node in a network. This could, in some cases, eliminate the need for IBM front-end processors at remote sites.

Cisco Systems said it will port software from Brixton Systems, Inc. of Cambridge, Mass., to its line of bridge/routers, giving them the ability to emulate IBM PU Type 4 devices — which are front-end processors. In SNA networks, front-end processors are largely in charge of routing data.

"Once incorporated into Cisco routers, this product potentially will displace IBM sales of remote FEPs," said Rick Malone, a principal with Vertical Systems Group, a consultancy in Dedham, Mass. "This is a capability that can be

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Senator Al Gore pitches supercomputer net plan at last week's Communication Networks '91. See coverage throughout the issue.

## Users build client/server future on SAA foundation

By Wayne Eckerson  
Senior Editor

Companies that have standardized on IBM's Systems Application Architecture (SAA) say it provides an ideal framework for building the next generation of cooperative processing and client/server applications.

The users said committing to SAA was a strategic business decision that will enable them to develop better applications and help them

achieve greater returns on information technology investments.

"We looked at our business strategy and the [system] requirements for supporting that strategy.

"It all pointed to SAA," said Keith Sievers, who holds the position of vice-president and treasurer of information systems (IS) at Federal Kemper Insurance Co. (FKI) in Decatur, Ill.

SAA is a set of guidelines es-

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## IBM, DEC deal with Novell on NetWare

Novell, IBM work on Portable NetWare for AS/400, RS/6000; DEC to roll out token-ring products.

By Eric Smalley  
Senior Editor

BOSTON — IBM and Digital Equipment Corp. are expected to announce formal alliances with Novell, Inc. at the NetWorld '91 trade show here next week.

Novell and IBM will announce plans to deliver NetWare for IBM's RISC System/6000 workstation and Application System/400, as well as software enabling IBM hosts to act as servers. DEC will discuss plans to support Novell's Internetwork Packet Exchange (IPX) protocols in its PathWorks server software.

The IBM-Novell move is expected to put added pressure on the already strained relationship between IBM and Microsoft Corp., which is placing more emphasis on its Microsoft Windows product (see "Microsoft unveils Windows plans, denies OS/2 rumors," page 2).

Novell's agreements with IBM and DEC are expected to focus on increasing the interoperability between the companies' network environments. The alliances can be viewed as attempts by IBM and DEC to recognize Novell's extensive installed base and coexist with it, said Frank Dzubeck, presi-

dent of Communications Network Architects, Inc., a Washington, D.C. consultancy.

Michael Howard, president of Infonetics Research Institute, Inc., a San Jose, Calif., market re-

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### INSIDE



PHOTOS ©1991 WALTER CALAHAN

Pioneering users honored by Network World, page 4.

## IBM to bring OS/2 into APPN family

By Paul Desmond  
Senior Editor

WASHINGTON, D.C. — IBM last week revealed new details about its plan to expand support for Advanced Peer-to-Peer Networking (APPN) within SNA and said OS/2 would be the next platform to be brought into the APPN fold.

At a briefing at the Communication Networks '91 conference here, Rick McGee, manager of communications systems architecture, said IBM will announce and ship support for APPN on OS/2 within a year.

This promises to make it easier for users of workstations and local-area networks to develop distributed or client/server applications by reducing the amount of programming required to enable one workstation

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### NETLINE



**MICROSOFT RESTATES** commitment to OS/2, following reports that it was abandoning the operating system. Page 2.

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**WILTEL TO OFFER** frame relay service, buys Centel PBX unit. Page 4.

**ARTIFICIAL REALITY** and networks are a perfect match, says visionary Myron Krueger. Page 51.

### FEATURE



## Carriers slowly improve management offerings

By Daniel Briere  
Contributing Editor

What do network managers want in a long-distance carrier's net management service?

End-to-end integrated management, user-friendly standardized software to help in networkwide troubleshooting and reporting capabilities — to name just a few features.

But what do managers get from these services? Usually,

quite a bit less than they want.

The major interexchange carriers — AT&T, MCI Communications Corp. and US Sprint Communications Co. — all offer network management services. The hard part for them has been to provide integration.

Still, the carriers have been trying. First, they are developing management-unifying plat-

forms that offer customers fo-

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# Microsoft unveils Windows plans, denies OS/2 rumors

The firm has not given up on OS/2 but is shifting emphasis from Presentation Manager to Windows.

By Caryn Gillooly  
Senior Editor

REDMOND, Wash. — After issuing a statement last week denying reports that it would drop support and development of OS/2, Microsoft Corp. admitted it is planning to shift some developmental support from the IBM Presentation Manager graphical user interface associated with OS/2 to Microsoft Windows.

In response to an article in *The Wall Street Journal* that said Microsoft was going to scrap OS/2, Bill Gates, Microsoft's chief executive officer, issued a statement saying, "For customers needing high-end capabilities, we market and support

OS/2. We will continue to enhance it in the future and enable it to run Windows applications."

Bob Muglia, director of advanced operating systems program management at Microsoft, said the company had wrongly predicted that the market would make a wholesale migration from DOS to OS/2. Now Microsoft realizes "people will stay with DOS," Muglia said. "They will use Windows on top of DOS, and we don't anticipate that will change."

Microsoft sees the industry as having segmented into three areas: the low end, where customers will continue to use DOS without a graphical user interface; the

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## AT&T ACD package routes calls to homebound agents

AT&T also announces SNMP support for Integrator.

By Bob Wallace  
Senior Editor

WASHINGTON, D.C. — AT&T announced at last week's Communication Networks '91 (ComNet) conference new software that will enable its automatic call distributors (ACD) to route calls and customer data from call centers to agents working at home.

AT&T also used ComNet to announce that its Accumaster Integrator net management product will support the Simple Network Management Protocol. In addition, Digital Equipment Corp., in conjunction with AT&T, introduced a gateway linking DEC VAXes to AT&T private branch

exchanges.

AT&T's new call center software, dubbed Home Agent, runs on its Conversant Voice Information System and instructs AT&T Definity Generic 1 and 2, System 75 and System 85 PBXs configured as ACDs to route calls to agents working at home.

Home Agent enables users to extend their call centers beyond physical sites and employ agents who cannot work in traditional call centers, including parents of small children, retirees and handicapped persons.

An agent working at home calls into the Conversant or the

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## FCC: Fate of Tariff 12 may depend on broader issue

By Anita Taff  
Washington Bureau Chief

WASHINGTON, D.C. — The FCC last week laid out the scope of its court-ordered reinvestigation of Tariff 12 and, in a surprise move, one commissioner said the fate of the custom network arrangements may be linked to a broader proceeding on AT&T's dominance.

In a brief order issued Friday, the Federal Communications Commission said it will limit its reexamination of Tariff 12 to the first four Virtual Terminal Network Service deals — the only ones in existence at the time AT&T's rivals filed a court chal-

lenge to the FCC's approval of Tariff 12.

The primary issue in the investigation is whether the discounts offered in Tariff 12 deals can be justified. In order to allow AT&T to offer Tariff 12 arrangements, the FCC must show that services packaged under Tariff 12 are different from identical services purchased under individual tariffs.

A federal appeals court last October said the FCC had relied on improper factors in allowing the deals and had failed to resolve a number of other legal questions concerning Tariff 12.

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## Briefs

**Cable & Wireless acquires carrier.** Cable & Wireless PLC's North American subsidiary last week agreed to acquire TRT/FTC Communications, Inc., an international carrier, from Pacific Telecom, Inc. at a cost of about \$174 million. John Davenport, chief executive officer of Cable & Wireless North America, said the acquisition would make it the fourth largest carrier in the U.S. in combined domestic and international sales. TRT/FTC has operating agreements for voice services with more than 20 countries and messaging service operating agreements with over 100 countries. The deal should be completed in five months, subject to Federal Communications Commission approval.

**Sikes seeks to calm merger fears.** In a letter sent to lawmakers last week, Federal Communications Commission Chairman Alfred Sikes said the commission is confident AT&T's proposed takeover of NCR Corp. would not harm telecommunications users. Sikes said there are numerous safeguards, including price cap regulation, accounting rules and competition, that would prevent AT&T from abusing the relationship between its computer and phone businesses. The letter was in response to an inquiry from Rep. Edward Markey (D-Mass.) and other lawmakers. Despite Sikes' assurances, they said they have concerns about the takeover.

**Wrapping up X.400 interconnections.** The Electronic Mail Association (EMA) last week said members who launched a project in 1989 to interconnect their electronic mail services have completed the effort. The EMA said interconnection of the six E-mail services will enable a user connected to one vendor's system to communicate with users on any of the other messaging nets. The services joined are MCI Communications Corp.'s MCI Mail, US Sprint Communications Co.'s Sprint Mail, General Electric Information Services' net, BT Tymnet, Inc.'s Dialcom, the IBM Information Network, and AT&T's AT&T Mail and Easy Link.

**More fiber in the Atlantic.** AT&T last week announced plans to cut over its fourth submarine fiber-optic cable linking the U.S. to Europe. The Trans-Atlantic Telecommunications (TAT)-9A cable, which will link the U.S. to the U.K. and France,

will consist of two fiber pairs running at 560M bit/sec and is scheduled to be cut over in the second half of 1993. TAT-9A will follow the installation this October of the TAT-9 cable, which will link the U.S. and Canada to the U.K., France and Spain, as well as the 1992 cutover of the TAT-G-1 cable, which will link the U.S. to Germany and the Netherlands.

**FCC OKs Ericsson PBX tests.** Ericsson last week said the Federal Communications Commission granted it an experimental license to test its DCT 900 wireless private branch exchange system in Anaheim, Calif., and Washington, D.C. The DCT 900 operates in the 940- to 952-MHz band using Time Division Multiple Access spread-spectrum technology. The two-year tests of DCT 900 will attempt to prove that wireless PBXs can coexist in the 940- to 952-MHz band used by news organizations for point-to-point radio communications.

**NEC serves up SMDS switch.** NEC America, Inc.'s Switching Systems Division last week announced the NEAX 61E SMDS Service Node, a cell relay switch for use in public and private networks. The device supports speeds of 1.544M to 45M bit/sec and uses Asynchronous Transfer Mode switching, enabling carriers to offer broadband offerings such as Switched Multimegabit Data Service (SMDS). The NEAX 61E SMDS Service Node is available in three configurations: The System 10 can be used in public and private nets, the System 20 is a mid-range version of the switch, and the Model 30 is designed for use in metropolitan-area networks.

**IBM wins big federal net contract.** The Administrative Office of U.S. Courts last week awarded IBM and two other vendors a multimillion-dollar contract to build a nationwide data communications network for the judicial branch of the U.S. government. The contract calls for installation of local-area networks at numerous federal judicial offices, including the U.S. Supreme Court and U.S. District Courts. IBM said the contract could reach a value of \$233 million. The network may ultimately consist of 2,150 LANs and 14 electronic mail hosts connected via the Federal Telecommunications Systems 2000 net. Computer Sciences Corp. and ARIX, Inc. teamed with IBM on the bid.

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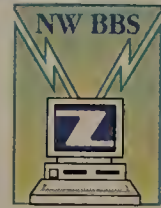
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### Networking

### Marketplace

### Networking Careers

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### NW Bulletin Board

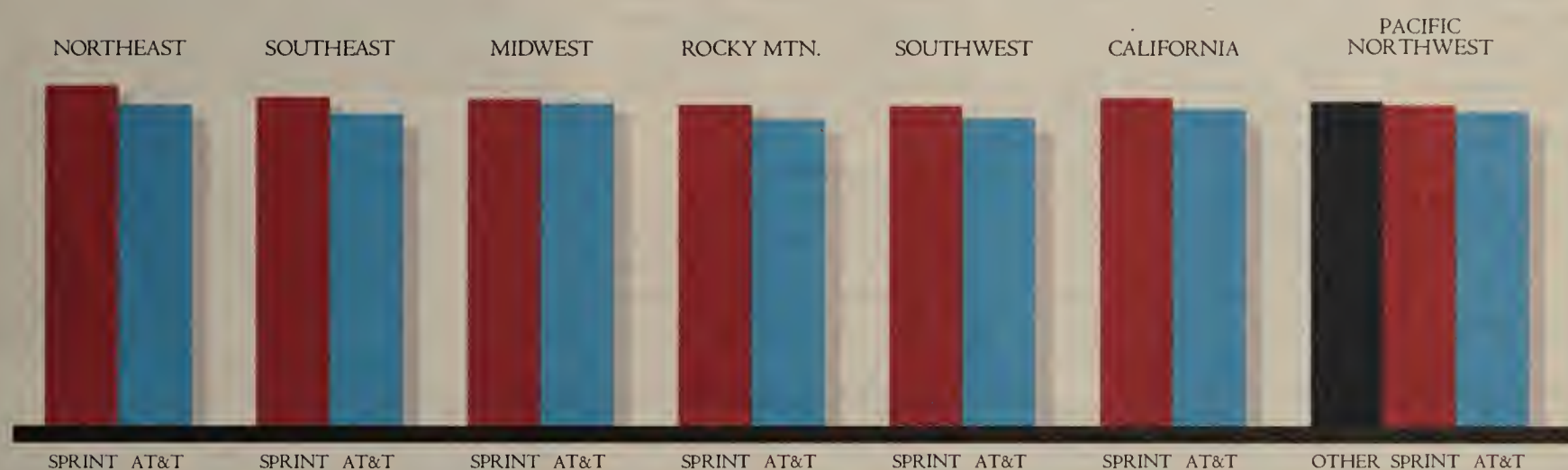
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### DEDICATED DATA CIRCUITS RATED BY REGION



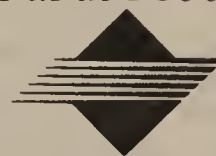
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# Users push pilot projects at first Net Computing Forum

Say technology needs live testing to succeed.

By Jim Brown  
Senior Editor

WASHINGTON, D.C. — Attendees at the first Network Computing Forum here last week agreed that developers and users need to start piloting distributed computing applications to prepare for widespread implementation of the technology in 1994.

Held in conjunction with Communication Networks '91 by conference sponsor World Expo Corp. of Framingham, Mass., the forum was designed as an educational arena to examine the nascent technology.

About 300 information systems and communications managers attended the meeting. The next Network Computing Forum is scheduled for July 15 to 18 in San Francisco.

With network computing, an application can be broken into several pieces and distributed to various systems across a network. Advanced network services, including remote procedure calls (RPC), are used to enable one system to transparently invoke application processing tasks on another.

"You've got to start piloting this stuff," said Michael Millikin, vice-president of technology for Patricia Seybold Office Computing Group, a research firm in Boston. "It is not going to do any good to wait."

Network computing, also

known as distributed computing, will enable developers to distribute certain processing tasks, such as number crunching, to the machine best suited to execute them and to enable multiple users to share access to that task.

The concept has been proven in scientific and engineering applications developed with tools such as the Network Computing System from Hewlett-Packard Co.'s Apollo Division and Open Network Computing products from Sun Microsystems, Inc.

The Open Software Foundation is currently building a set of tools based on technology provided by Apollo, Digital Equipment Corp. and others. Called the Distributed Computing Environment (DCE), the tools are being positioned as a de facto industry standard for network computing. Early versions of DCE are expected to ship in mid-1991.

All these approaches use varying RPC technology, something that may make users uneasy about committing to a proprietary approach. Users might do better to wait for the International Standards Organization to approve a standard RPC. A draft international RPC standard is expected by June 1992, with final adoption scheduled for June 1993.

RPCs make it easier for programmers to build net support into applications by enabling

them to write subroutines designed to invoke tasks as if they were on the local system and link them to the RPC via a familiar application program interface (API). The RPC uses net naming services to find the system to process the task and uses defined net protocols to pass commands.

Without an RPC, programmers are forced to learn a range of communications protocols and how to use various APIs to build support for those protocols into the application.

While a growing number of users are only just starting to investigate network computing, others have already embraced it.

"Some of us needed to get the job done a lot sooner," said Percy Young, manager of store systems for Burlington Coat Factory Warehouse Corp. "So we had to be an early implementor."

## Early proponents

Young said his company used many existing products and internally developed software to build a distributed computing application that ships sales information from 160 stores to its data center and downloads pricing changes to all of its stores.

Each store is equipped with a local-area network supporting NCR Corp.'s electronic cash registers and a Sun workstation acting as a file and communications server. An application running on the registers passes sales data to the workstation using Sun's Network File System. The workstation runs custom software to compile sales data and passes it at specified times via a satellite network to a network of Unix-based

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# User Excellence winners honored at ComNet show



WASHINGTON, D.C. — *Network World* last week honored the winners of its Sixth Annual User Excellence Awards during a special ceremony at the Communication Networks '91 conference here.

In a presentation following a keynote speech by Paul Stern, chairman and chief executive officer of Northern Telecom, Inc., cowinners American Airlines Decision Technologies,

metz and Susan Starkie, project manager for reservations with American Airlines (see photo, upper right).

"We want to thank *Network World* for honoring us with this award and for being alert to innovative approaches to networking," Steinmetz said.

On hand to accept awards for honorable mention were Edward Ward, network services



Inc. and First National Bank of Maryland accepted their User Excellence Awards.

First National Bank of Maryland is a subsidiary of First Maryland Bancorp.

William Spies II, divisional vice-president of First National Bank and an officer of First Maryland Bancorp, said, "We are deeply honored and truly appreciate receiving this presti-

manager at American Management Systems, Inc. (see photo, lower left) and Edward Furtak, assistant director of federal government relations for the University of California at San Diego (see photo, lower right).

Other honorable mention award winners not on hand were: The Number Nine Maintenance Systems Division of Allegheny Ludlum Steel, a subsidiary of Allegheny Ludlum Corp.; Edward D. Jones and Co.; and K Mart Corp.

"*Network World's* User Excellence Awards honor the visionaries, the pioneers," said *NW* Editor John Gallant. "They recognize the successful marriage of technology and business strategy, and honor the companies and the men and women who prove the power of networking to transform an organization, to reshape a business." □

gious award." (Top photo shows Spies and network staffers of First National Bank of Maryland.)

American Airlines Decision Technologies was represented by Vice-President Chip Stein-

# WilTel to support frame relay, acquire Centel PBX

By Bob Wallace  
Senior Editor

TULSA, Okla. — Williams Telecommunications Group, Inc. (WilTel) is upgrading its Northern Telecom, Inc. network switches to deliver a public frame relay service that will be available starting next month.

Barring announcements from rival carriers, WilTel would be the first carrier to deliver a frame relay service. The offering would be available before services announced by value-added network providers such as Sprint Data Group and BT Tymnet, Inc.

A spokesman confirmed WilTel's plan to offer a frame relay service and said that service would be announced in a few weeks. Sources close to the project who requested anonymity said the service would be available the first week of March.

Sprint Data Group's frame relay service is expected to be available in the third quarter of this

year. BT Tymnet, which announced a similar service last week at the Communication Networks '91 (ComNet) conference in Washington, D.C., said its offering will be available in June ("BT Tymnet to reveal frame relay service," *NW*, Jan. 28).

WilTel declined to disclose details on how widely the service will be deployed, how it will be accessed or what it will cost.

Sources said the carrier will upgrade its Northern Telecom switches with the switch maker's DataSPAN software to deliver the frame relay service. Northern Telecom announced in August the optional software for its DMS-100 and DMS-250 SuperNode digital central office switches.

Separately, WilTel announced at ComNet an agreement in principle to acquire Centel Corp.'s Centel Communications Systems private branch exchange and key system distribution unit from Interconnect Acquisition Corp.

If the deal is completed, WilTel, a national private-line service provider, plans to market turnkey systems consisting of PBXs, key systems, telemanagement software and services provided over its nationwide fiber and digital microwave net.

Centel Communications Systems, a top Northern Telecom PBX and key systems distributor, also sells Rolm Co. switches and telemanagement software developed by third parties. Terms of the deal were not disclosed.

Interconnect Acquisition reached an agreement in principle to buy Centel Communications Systems from Centel Corp. several months ago. WilTel, in turn, is acquiring 90% of the company whose two top executives will continue to run the organization. Centel Communications Systems will retain its name and operate as a WilTel subsidiary.

Centel Communications Systems, based in Rolling Meadows, Ill., reported revenue of \$217.5 million in 1990. The company has 1,900 employees in 65 offices nationwide and runs a Technical Assistance Center in Houston. □

**"Network  
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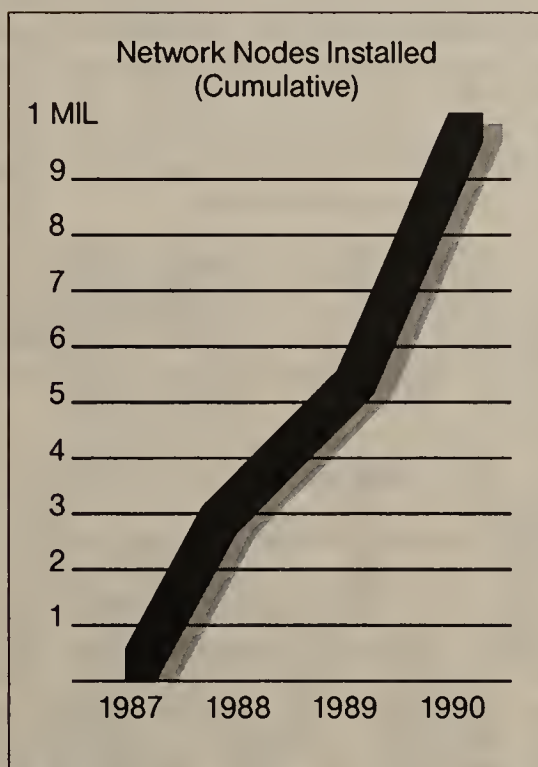
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Don't miss the Hub of NetWorld at booth #2426.



# MCI to act as go-between for users building int'l nets

Carrier will handle details with European firms.

By Barton Crockett  
Senior Editor

WASHINGTON, D.C. — MCI Communications Corp. last week announced a new international service in which it will work on behalf of users with numerous European carriers to design, build and maintain multinode, international networks.

Under its new Global Communications Service (GCS), users will put MCI in charge of securing international private lines, packet switching, collocation and network maintenance services from 17 carriers in 13 countries.

"Building international nets is a big headache for most users," said Seth Blumenfeld, president

of MCI International. "GCS will let users avoid this by using us as a single point of contact."

MCI introduced GCS at the Communication Networks '91 show here.

MCI said it has struck cooperative agreements with Mercury Communications, Ltd. in the U.K., Germany's Deutsche Bundespost Telekom, Belgium's Regie des Telegraphes et des Telephones, Italcable of Italy, Hong Kong Telecom International, Telefonos de Mexico S.A. de C.V., and the two Japanese international carriers International Telecom Japan, Inc. and International Digital Communications, Inc., among others.

MCI also said it will use international public data net and facilities management services from Infonet Services Corp. in GCS packages. MCI owns 25% of Infonet; 10 foreign carriers own the rest.

MCI added that it is negotiating GCS agreements with British Telecommunications PLC, Japan's Kokusai Denshin Denwa, Ltd. (KDD), the Telecommunications Authority of Singapore and national carriers in Switzerland and Taiwan.

According to Blumenfeld, GCS goes beyond MCI's existing international one-stop shopping services, Global Advantage and Commax, by supporting multi-node nets and multiple services.

Under Global Advantage, MCI only offers users a single bill and single point of contact for private lines connecting a single U.S. network node to a single foreign node. With Commax, MCI, British

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# IBM, BellSouth unite on high-speed net R&D effort

By Bob Brown  
Senior Editor

WHITE PLAINS, N.Y. — IBM and a subsidiary of BellSouth Corp. last week announced an agreement to jointly conduct research and development of high-speed network technologies over the next three years.

The goal of the project is to address users' needs for high-speed transmission of voice, data, image and multimedia information. The study will combine IBM's data networking expertise with the public switching experience of BellSouth Services, Inc., a BellSouth subsidiary that is jointly owned by Southern Bell Telephone and Telegraph Co. and South Central Bell Telephone Co. IBM's fast packet technology,

dubbed Paris, will provide the base for experimentation and analysis.

Paris is an IBM prototype high-speed packet-switching net that supports voice, data and image transmission over Synchronous Optical Network links.

Other technologies, including Switched Multimegabit Data Service, will also be studied.

Bernard Puckett, an IBM vice-president and general manager of application solutions, said the study will help address emerging multimedia applications.

"Applications such as transmission of multimedia information require new ways to connect computer sites since they necessitate moving large volumes of data," he said. □

# Users mixed on value of frame relay

Network World Staff

WASHINGTON, D.C. — While a number of vendors touted frame relay offerings at the Communication Networks (ComNet) '91 conference last week, users at the show expressed uncertainty about when, or if, the technology will play a role in their networks.

As expected, BT Tymnet, Inc. revealed plans to enhance its public packet net to offer a frame relay service and General Data-Comm, Inc. said it will offer a frame relay interface for devices using IBM's Synchronous Data Link Control or Binary Synchronous Communications protocols (NW, Jan. 28).

But users interviewed on the exhibit floor had mixed feelings about frame relay.

Robin Layland, engineering consultant for The Travelers Companies in Hartford, Conn., said he's interested in frame relay because it provides standardization at the data-link level and another option for accessing carrier nets.

But Layland, who also participated in a ComNet panel discussion dubbed the "Frame Relay Roundup," said he doesn't expect frame relay to offer great performance benefits. "We consider it important," he said. "But it's not something we have to have today or drop dead."

Harvey Young, senior project manager with Neptune, N.J.-based Continental Insurance Co.'s Technology Planning Systems Division, said his company is exploring what frame relay will bring to its X.25 packet net.

"We think frame relay will help us build on the advantages of X.25," he said. "It's a better way to do packet. It will make more cost-effective use of our network resources and provide bandwidth on demand. In some cases, it will allow us to shift traffic from public to private facilities."

Young said the company may implement frame relay before year end and that it is already pressing vendors to outline their plans for supporting the technology. He said Codex Corp.'s support for frame relay was important to the company, which is a large user of Codex equipment.

Tim Riddell, director of technology with FMC Corp. in Dallas, said his company has already put most voice and data on a T-1 backbone but it has to dedicate channels for different applications. He expects frame relay with fast packet will obviate the need for that, giving FMC greater efficiency from the backbone.

But he added that frame relay could actually impose delays. The company uses Cisco Systems, Inc. routers with a T-1 interface, and Riddell is worried that adding another layer of routing will adversely affect overall throughput.

A representative of a major university who asked not to be named also voiced concern about frame relay.

"It would not serve our needs since we're in a campus environment," the user said. "Vendors have done a fine job of letting users know what frame relay is good for. But I don't think they've done a very good job articulating the shortcomings. Is frame relay going to help us with our voice traffic? Can I afford to put really critical data across a frame relay network? I don't know."

Michael Halbrook, director of computer information systems with the Investment Company In-

(continued on page 50)

# Apple requests exclusive spectrum for wireless LANs

By Ellen Messmer  
Washington Correspondent

CUPERTINO, Calif. — Apple Computer, Inc. last week petitioned the Federal Communications Commission to allocate radio spectrum exclusively for wireless local-area networks, a move that could be detrimental to private microwave users.

Apple urged the FCC to set aside 40 MHz of bandwidth in the 1,850 MHz-to-1,990 MHz band to spur U.S. investment in the development of wireless LAN products.

If the FCC grants the petition, the move could have dour effects on private microwave users licensed to operate in the 1,850 MHz-to-1,990 MHz portion of the spectrum since they could be forced off the bandwidth.

Apple said it wants the FCC to enact regulations that would prohibit any user or service provider from getting an exclusive license to the 40 MHz requested for a

wireless LAN. The effect would be that users would face no transmission fees as long as their wireless LAN is contained on a user's premises.

In addition, Apple requested that any bandwidth set aside for wireless LAN traffic not require use of spread-spectrum technology. Previously, the FCC had approved experiments to use spread spectrum as a means to let private microwave users share bandwidth with personal communications networks (PCN).

Apple declined to comment on its plans to develop products using wireless LAN technology.

The vendor urged the FCC to set aside the spectrum in advance of the World Administrative Radio Conference (WARC) '92 ("PCN spectrum issue sparks global battle," NW, Nov. 19, 1990). Many nations will gather at WARC '92 early next year in Spain to discuss radio spectrum

allocations for a number of new applications, including PCNs.

## Threat to users

The Apple petition is viewed as a threat by large numbers of private microwave users at utilities, petroleum companies and railroads.

Jeff Sheldon, associate general counsel for the Utilities Telecommunications Council, said at least 100 electric, gas and water utilities have operational fixed microwave systems valued at half a billion dollars in the 1,850-MHz band.

"We're using microwave because we can't rely on other technologies," Sheldon said. "The commission is going to have to make a public interest determination: Do they want reliable communications for core utilities or for people to run laptops without wires?"

Robert Raish, an attorney at Washington, D.C. law firm Fletcher, Heald & Hildreth representing the railroads, called microwave use essential for the safe and efficient operation of the industry. □

# Users push pilot projects

continued from page 4

data base servers in the company's data center.

The company is also linking the sales systems to an inventory control application that will automatically transmit replenish orders to a warehouse.

This approach is opposed to pure batch processing in which a centralized computer polls each remote site at specified times to collect sales data and then produces reports used to determine when merchandise should be replenished.

Other users that couldn't wait

for tools based on standards have customized existing products.

General Electric Capital Corp.'s Fleet Services division developed an RPC-like tool that enables multiple workstations on a token-ring LAN to use a single copy of IBM's Advanced Program-to-Program Communications software on a server in order to establish a peer-to-peer link with an IBM 3090.

"The tools to do all this aren't here yet so we had to write a lot of this ourselves," said Larry Runge, director of advanced systems technology.

"We're using a 3090 as a huge data server," Runge said. The application helps GE better service

customers who rent its vehicles by enabling customer service representatives to transparently access the host and look up data such as vehicle repair histories.

IBM Personal System/2s attached to remote token rings run a piece of the application that supports screen presentation services, data entry and editing functions. The PS/2s use Novell, Inc.'s NetWare to transparently forward requests for host data to the server.

The server is running a GE-developed RPC-like tool that detects incoming requests and automatically converts them into APPC commands used to establish a host link. □



## THE CODEX 3380 19.2 Kbps MODEM CAN SAVE ENOUGH ON LINE COSTS TO PAY FOR ITSELF.

If your throughput requirements keep increasing, but you think moving from 9.6 to 19.2 Kbps costs too much, here's good reason to think again:

A Codex 3380 19.2 Kbps modem costs only \$2,995 (quantity one). For each pair of 3380s installed in place of 9.6 Kbps modems, you double your throughput without doubling line costs. For example, if your line costs are \$12,000 a year, a pair of Codex 3380s pay for themselves in as little as six months. The more lines you use, the more reason to upgrade right away.

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\$5,990	÷	\$12,000	=	0.5 OR 6 MOS.

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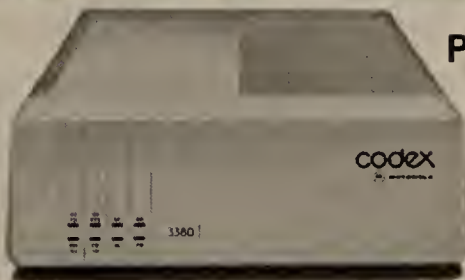
\$2,995 for a Codex 3380 buys you more than just line savings. You're buying Codex performance and reliability. Which means you get 19.2 Kbps throughput all the time, not just at peaks. There's an optional feature that provides automatic dial restoral when line conditions degrade. And you get our priority on-site one year warranty.

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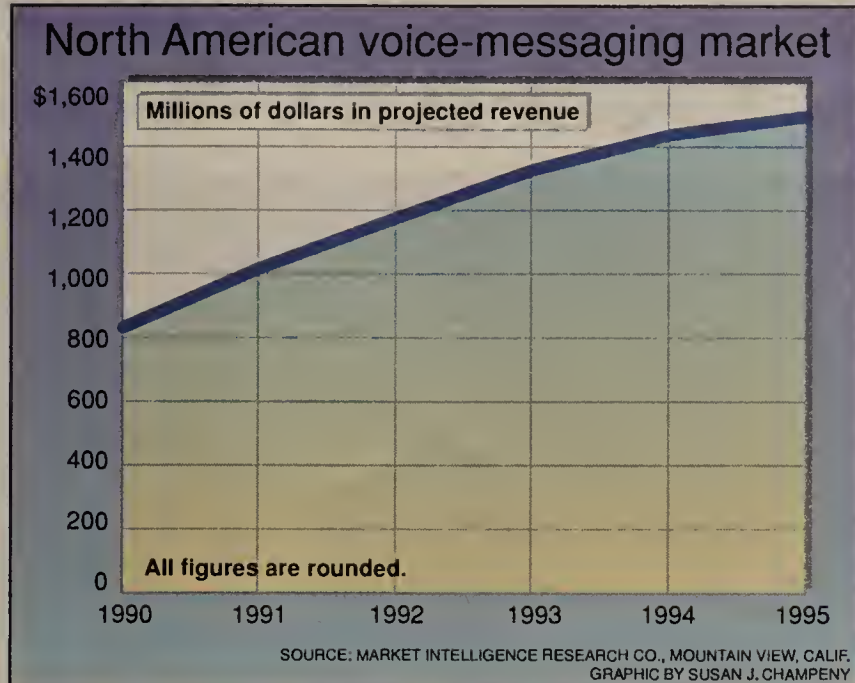
# INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS AND FINANCIALS

## Worth Noting

“Vendors that sell both PBXs and voice messaging are tough to compete against. I foresee a shakeout in the market, especially at the low end.”

**Lisa French**  
Senior associate  
Vanguard Communications Corp.  
Santa Clara, Calif.



## Some voice mail firms hit hard by economic malaise

Buyers may gain from price cuts, other incentives.

By Bob Brown  
Senior Editor

Battered by recent weak financial results, some leading voice-messaging system suppliers are likely to compete more aggressively, dangling price cuts or other incentives before potential buyers, industry observers said last week.

Digital Sound Corp. has cut its work force by 25%, while VMX, Inc. reported nearly a \$3 million loss for its second quarter and said it has also trimmed its work force. Even market leader Octel Communications Corp. posted a 10% drop in second-quarter earnings.

“The industry is getting

terms — have been hit hard by the worldwide economic downturn, observers said. While user opinions are changing, many still consider voice messaging to be a discretionary purchase, said a spokesman for VMX.

“There’s not one pending event that occurs to signal that your firm has got to have a voice-messaging system,” he said. “So some users are holding off.”

That is why some vendors are expected to aggressively push the hard and soft dollar benefits of using voice messaging, according to Alex Cena, a financial analyst at William K. Woodruff & Company, Inc., a brokerage firm in Dallas. Last year, Octel began training its sales force on how to sell during a recessionary market, he added.

“This approach makes a lot of sense when the economy is the way it is,” Cena said. “Hard dollar savings involve using a voice-messaging system instead of live receptionists. Soft dollar savings involve making an executive’s assistant more productive by freeing up the assistant from answering the phone and taking messages.”

Some vendors have also been hurt by the failure of many regional Bell holding companies to embrace voice messaging as a service to be offered to their customers, said Paul Stockford, an industry analyst at Dataquest, Inc., a San Jose, Calif., market research firm.

As a result, vendors that have been banking on big purchases by telephone companies may start putting more emphasis on customer premises equipment sales. “More competition in CPE would be good news for customers,” he said. □

Some vendors have been hurt by the failure of many regional Bell holding companies to embrace voice messaging.

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tougher,” said Chris Seelbach, an analyst at Probe Research, Inc. in Cedar Knolls, N.J.

However, some companies have managed to evade market losses. AT&T, Northern Telecom, Inc. and Rolm Co. have fared well, largely through sales of voice mail packages bundled with their private branch exchanges, he said.

Vendors such as Digital Sound, VMX and Octel — whose primary business is voice-messaging sys-

## Touch package to aid vendors’ OSI efforts

Alliance software meets OSI net mgmt. specs, enabling vendors to offer standard net control.

By Jacqueline Emigh  
Staff Writer

CAMPBELL, Calif. — Touch Communications, Inc. recently introduced Open Systems Interconnection software that will help other vendors build industry-standard network management support into their products.

The Alliance OSI Management package is protocol-independent and designed to meet the Release 1 specifications of the OSI/Network Management (NM) Forum.

The package comprises four modules that link the OSI protocol stack to non-OSI net management systems and managed devices.

Management Communication Services (MCS), a foundation module, sits on top of the upper layer of the protocol stack, the Common Management Information Protocol (CMIP). The other Alliance modules include an application program interface for non-OSI net management systems, a tool kit for integrating non-OSI devices and a system agent, which routes information between the stack and the devices.

In mid-January, AT&T Network Systems International announced it would use Alliance to

add OSI capabilities to its Lightwave family of Synchronous Optical Network transmission and management systems.

Several other suppliers are now evaluating the software, and Alliance is expected to be released on the open market in April or May, said Vincent Hunt, product marketing manager for Touch Communications.

Analysts hailed the new software as a sign that OSI network management has finally arrived. “This is the start of the gradual adoption of CMIP in place of the [Simple Network Management Protocol],” said James Herman, a principal at Northeast Consulting Resources, Inc. in Boston.

“The product’s close adherence to the OSI/NM Forum is an important step forward, tending to solidify the agreements the forum has created,” said Larry Marks, president of Distribute Systems Solution International, a Berkeley, Calif.-based consulting firm.

OSI/NM Forum members include major computer suppliers, such as Digital Equipment Corp., Hewlett-Packard Co. and IBM, as well as telephone equipment suppliers and seven carriers — AT&T, MCI Communications

(continued on page 48)

## INDUSTRY BRIEFS

**US Sprint reorganizes.** US Sprint Communications Co. recently announced an organizational realignment designed to help the company focus more closely on its marketing, sales and support functions, which have been divided into four market segment business units: international, major accounts, residential, and small and midsize businesses.

The changes are effective immediately.

US Sprint’s Consumer Services Group will be responsible for all market planning and sales in the residential marketplace, while the Business Services Group will conduct market planning and sales in the small and midsize business sector, and the Major Accounts Group will be responsible for marketing sales and services for large businesses, government and hospitality industry accounts.

The carrier’s National Services Organization will be responsible for all customer relations functions for residential and small to midsize business accounts, in addition to operator and conferencing services.

US Sprint also named Tom Weigman, a former senior partner at the Marketing Corporation of America in Westport, N.J., to the newly created position of chief marketing officer. Weigman will lead the carrier’s integrated corporate marketing efforts, which include overall market definition, brand positioning, product management and technology planning. □



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# TELECOMMUNICATIONS

CARRIER SERVICES, CENTREX, CPE, WIRING SYSTEMS AND BYPASS

## Worth Noting

**H**yatt Corp. recently launched a new service that enables members of its frequent guest program to check into their rooms before arrival. Users can call (800) CHECK-IN for a room assignment at one of 104 hotels in the U.S. and Canada.

## Carrier Watch

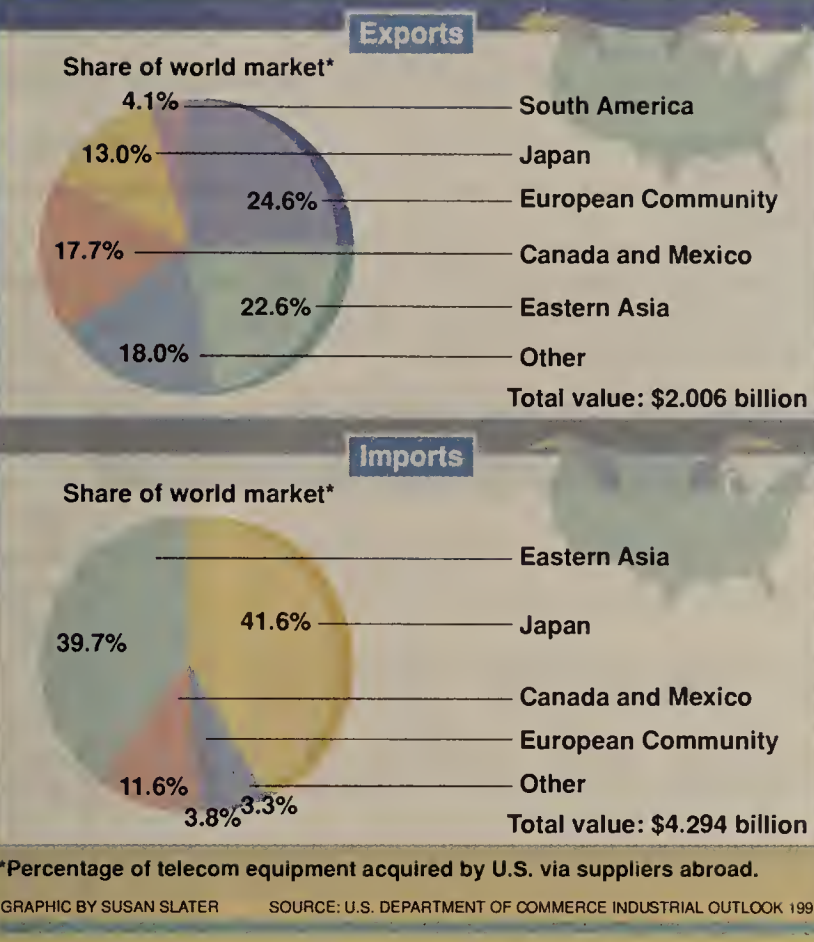
**AT&T** recently announced plans to install by year end an experimental wideband communications network at the Illinois Institute of Technology (IIT) in Chicago as part of a campus-of-the-future project.

The IIT/AT&T Campus Information System of the Future is intended to result in the development of Integrated Services Digital Network voice/data applications based on AT&T's Definity private branch exchange. The wideband network will provide videoconferencing among classrooms on IIT's campuses. The Definity PBX will use AT&T's ISDN Primary Rate Interface service to network IIT video equipment at speeds of 384K to 1.544M bit/sec.

**AT&T** is blaming the numbing cold blast that swept the Northeast in recent weeks for a six-hour service disruption that affected thousands of business and residential customers in central New Jersey on Jan. 22. Water froze in an AT&T fiber cable conduit under a highway between New Brunswick, N.J., and Freehold, N.J. Ice was forced against the fiber, scattering the light pulses used to transmit information.

AT&T technicians had a difficult time locating the cause of the problem because no cable was severed or cut. Services were disrupted at noon and fully restored by 6 p.m. The fiber carries private-line and switched traffic. **■**

## Distribution of telecom trade with the U.S.



## Carriers provide phones for Desert Storm troops

Mobile units are moved to the front with soldiers.

By Daniel Briere  
Contributing Editor

James Locurto, a staff sergeant in the U.S. Army stationed somewhere in the desert south of Kuwait, is used to seeing strange communications setups, especially close to the front lines. A satellite dish loaded on a truck with lots of wiring running to a camouflaged tent shouldn't seem too peculiar in a war environment.

**"The whole operation is a risky one for any of the carriers involved."**

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However, what was different about this setup was that there were 120 pay phones inside this tent, which had the MCI Call USA logo emblazoned on its side.

"As the troops move forward to the front, this truck simply picks up and moves alongside as far as we're allowed," said Seth Blumenfeld, president and chief operating officer of MCI International, Inc.

This setup is just one of many

commercial systems installed practically overnight to meet the extensive telecommunications demands of the soldiers and sailors involved in Operation Desert Storm.

"On Thursday morning, we gave the go-ahead; and by Monday night, the equipment was on a military transport heading for the region," Blumenfeld said. "And that was over Christmas."

Enlisting in the cause in September, AT&T was the first carrier in the region, followed by MCI in December and other carriers in January. Each allows calls from Saudi Arabia to the U.S. and, through special agreements with Deutsche Bundespost Telekom, to Germany.

There were strong public relations reasons for supporting the project, but providing service did not come without costs.

One of the biggest of those costs was insurance. "The whole operation is a risky one for any of the carriers involved," Blumenfeld said. "The military has not been able to guarantee that the equipment will not be destroyed or that we will ever be able to get the equipment out."

AT&T, MCI and other carriers say they would like to offer service free of charge as part of the overall initiative. AT&T has done so on two occasions, each time

(continued on page 12)

## AT&T encryption unit is NSA-approved

GE and Motorola also plan to launch into the commercial arena with STU-III-compliant wares.

By Ellen Messmer  
Washington Correspondent

**WASHINGTON, D.C.** — AT&T recently announced it will roll out a commercial line of voice and data encryption products by year end that meet the National Security Agency's (NSA) Communications Security (COMSEC) program.

The announcement of AT&T's 2000 Series of STU-III Secure Communications Products, which encrypt digitized voice and data for transmission, offers further evidence that technology developed for classified applications under COMSEC will soon be available for private sector and widespread government use.

Motorola, Inc. and General Electric Co.'s Government Communications Systems division, the two other participants in the COMSEC STU-III product development program, have promised to offer commercial versions of their NSA-restricted STU-III products this year.

The push by Motorola, GE and AT&T into the wider commercial arena is likely to help resolve the interoperability and voice-quality problems that have limited the

market for commercial voice-encryption products in the past.

Analysts warn, however, that the vendors may find a lukewarm reception to the new technology because exportation restrictions (continued on page 12)

## Classification of secure telecom devices

### Type 1 - Classified

To obtain units, users must have a National Security Agency communications security account.

### Type 2 - Unclassified but sensitive

Units are routinely available to all federal users. They are also available to private sector and local government users under a federal sponsorship program.

### Type 3 - Unclassified

No restrictions on availability of units but export is limited.

### Type 4 - Unclassified

Device is available for export.

SOURCE: NETWORK WORLD  
GRAPHIC BY SUSAN SLATER

## WASHINGTON UPDATE

BY ELLEN MESSMER

**National multigigabit net gains support.** Sen. Al Gore (D-Tenn.) and Rep. George Brown (D-Calif.) last week held a press conference to urge President Bush to include funding for a nationwide multigigabit data network in his new budget to be released today.

Gore and Brown recently introduced twin bills, both titled "The High-Performance Computing Act of 1991," in the Senate and House of Representatives.

The act calls for authorizations of \$650 million in spending for the National Science Foundation and \$338 million for the National Aeronautics and Space Administration between 1992 and 1996 for research and construction of a multigigabit network to be used by businesses and universities.

### NTIA takes stand on congressional proposal.

The National Telecommunications and Information Administration (NTIA) last week publicized its stance on congressional legislation that proposes to take 200 MHz of federally assigned radio spectrum and give it to the commercial sector for personal communications networks.

NTIA said it would support federal relinquishment of radio spectrum only if the spectrum were auctioned off to the private sector to compensate for the associated costs of equipment and other expenses incurred by moving federal users off the 200 MHz of spectrum. **■**



## AT&T encryption unit is NSA-approved

*continued from page 11*

impede international use and because the private sector is apathetic about security.

According to Jim Ross, president of Ross Engineering, Inc., a Sterling, Va.-based security consultancy, corporations are often indifferent to security concerns and reluctant to spend the money to secure their communications.

Ross said about 10 U.S. vendors offer voice encryption products, which range in price from \$2,000 to \$15,000, but that all of the equipment distorts voice and creates time lapses. The new equipment from AT&T and the other companies is designed

to overcome these limitations.

AT&T will roll out three devices, an integrated voice/data unit and separate voice and data devices. The data devices are designed for use with facsimile machines and personal computers. AT&T promises improved voice quality through a new voice-encoding algorithm called Code Excited Linear Prediction (CELP), developed by AT&T Bell Laboratories and now adopted as a government standard.

Because of the stringent requirements of the NSA COMSEC program, all three vendors' devices must be interoperable.

Although the new equipment will be generally less expensive than current technology — \$2,000 to \$4,000, depending on configuration — the companies ac-

knowledge that entering the market represents a gamble they are willing to take.

Dave Wolfe, Motorola's executive vice-

"There is no other major U.S. electronics manufacturer with a commercial presence in secure telephony," he added.

**B**ecause of the stringent requirements of the NSA COMSEC program, all three vendors' devices must be interoperable.

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president and general manager in the Government Electronics Group, said the secure telephony market could hit \$10 billion annually.

AT&T, Motorola and GE have offered what they call Type 1 STU-IIIs since 1987 for sale to Department of Defense personnel and contractors handling classified information. All Type 1 devices run a powerful NSA algorithm and have special combat casing (see graphic, page 11).

An administrative procedure is now in place that will enable the vendors to offer Type 2 voice/data encryption devices, which are technically less robust than Type 1 units, to a wider audience.

Type 2 devices encrypt voice and data by using both the National Institute of Standards and Technology (NIST) Data Encryption Standard (DES) and a less powerful NSA encryption algorithm.

Motorola will likely be the first COMSEC vendor to release a Type 2 device. It plans to release the SECTEL 2500 integrated voice/data terminal in February, pending final approvals from NSA. A spokesman for Motorola said it has already received \$4 million in government orders.

NSA and industry sources say federal users will be able to purchase Type 2 devices for the handling of unclassified but sensitive information with no special administrative process required.

Private sector users will be able to obtain Type 2 devices through sponsorship by NSA-designated authorities in each government agency. NSA will act as the central authority for administering the private-key management schemes and will distribute encryption keys to users for Type 2 units as it now does for Type 1.

Although the term "classified" is clearly understood to refer to information with national security implications, the term "sensitive" is an amorphous concept applying to information as diverse as agricultural production figures, or drug enforcement or financial information that could impact industry or government if available to the public. □

## Carriers provide phones for troops

*continued from page 11*

costing the carrier more than \$1 million. "We couldn't offer the service free at Christmas because it would have overloaded our circuits," said Dave Bickle, public relations manager for AT&T.

Indeed, the traffic has been incredible. AT&T is logging more than 5,000 calls a day, and MCI is logging nearly 4,000 calls daily. A spokesman for another carrier said the average holding time is more than 20 minutes per call.

Facsimile service has been one of the most popular offerings during the war. AT&T, which has been sending fax messages from 400 phone centers, as well as 60 bases in the U.S. and 20 in Germany, Italy, Spain and the U.K., has sent more than 700,000 fax messages free of charge. □

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# DATA COMMUNICATIONS

PRODUCTS, SERVICES, ARCHITECTURES, STANDARDS AND NETWORK MANAGEMENT

## Worth Noting

“We look at our network as something that really unifies the company.”

**Peter Brown**  
Corporate telecommunications manager  
Digital Equipment Corp.  
Maynard, Mass.

## Data Packets

**General DataComm, Inc. (GDC)** last week announced the NMC-90, a Unix-based management system for GDC modems and data service unit/channel service units (DSU/CSU) that will eventually replace GDC's existing personal computer-based NMC-70.

Among the enhancements the NMC-90 provides is the ability to remotely ship configuration data to a single circuit or to a group of circuits. That obviates the need for users to individually configure every modem or DSU/CSU.

The NMC-90 also has an automatic configuration capability that lets the user define default configuration values to which every modem or DSU/CSU will be set unless otherwise indicated by the operator.

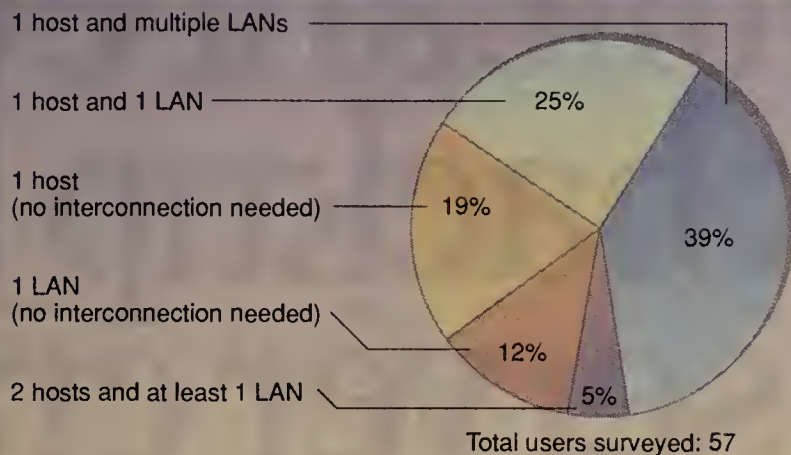
The NMC-90 runs on Sun Microsystems, Inc.'s scalable processor architecture family of workstations. The exact model depends on configuration. The software can also be upgraded to GDC's high-end Megaview T-1 management system. The NMC-90 is expected to ship in April. Its price starts at \$43,550 for a single-user version.

**Newbridge Networks, Inc.** last week announced an optical T-3 fiber interface card for its MainStreet 3645 multiplexers, which can support as many as eight T-3s. Newbridge currently supports only wire-based T-3 links. The firm said the new interface is a step toward supporting Synchronous Optical Network standards.

The interface card, which should be available late this year, has not been priced. ■

## Linking E-mail systems

### Types of systems users are linking



Total users surveyed: 57

Most users with multiple messaging systems have at least 1 host-based E-mail package and 1 LAN-based package.

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.

## Survey: Buyers are wary of untested X.400, fax gear

IS managers fear products have not yet matured.

**By Ellen Messmer**  
Washington Correspondent

FRAMINGHAM, Mass. — Information systems (IS) executives perceive X.400 and facsimile connectivity products as untested technologies, according to a newly published study.

The report, "Messaging Connectivity: An End-User Survey," stated that IS executives at some of the nation's largest companies are interested in X.400 gateways but so far have shied away from them because they fear the products have not yet matured.

Published by International Data Corp. (IDC), based here, the study examined 62 large corporate sites and found none that had installed fax server software or gateways.

According to the report, 61% of the 62 corporations surveyed have sites where X.400 gateways could be useful because of disparate electronic mail systems. The IDC report said only 31% of the respondents had multiple systems fully connected (see graphic, this page).

"There is still a big market for interconnecting systems," said Dave Atlas, the senior analyst at IDC who headed the project. Atlas pointed to growth in enterprisewide systems as a market driver. But he noted that users are still struggling to understand the X.400 standard and related products, and added that a lack of knowledge concerning fax gateways is equally common.

The corporations surveyed represent a broad slice of business and government interests, with manufacturing firms constituting 31% of the tally. The responses of corporate IS directors were the primary source of information.

The IDC team conducted the survey at 62 Fortune 1,000 companies having at least one local-area network and one host system.

The study determined that there were an average of 425 users at each site, 87 users for each LAN system and 318 users at each host system.

According to the IDC survey, 35% of the IS directors at sites with several unconnected messaging systems plan to purchase at least one gateway within the next 18 months and another 17% said they plan to purchase a gateway after that time.

Of the 29% of respondents that answered either "don't know" or "longer than 18 months" to the question of purchasing a gateway product, the IDC report noted that they expressed concerns about the reliability of products and how well they conform to standards.

### Limited interest

The portion of the survey dealing with fax products revealed little interest in that market segment. The study found that no respondents have purchased a LAN fax server or a host-based fax gateway — products that allow users at computers connected to LANs or host computers to send and receive facsimiles.

The report concluded that the lack of knowledge among users about fax products was not surprising since fax connectivity products have only been available since late 1989.

But the study called the attitude of the respondents surprising. "There was almost an attitude of fax being in a different sphere entirely from MIS," the report stated. ■

## Image processing net improves GE service

Images scanned into jukebox when received, reducing image retrieval time and data entry errors.

**By Barton Crockett**  
Senior Editor

PLAINVILLE, Conn. — General Electric Co.'s Electrical Distribution and Control division last week said it has installed a networked image processing system that is helping to dramatically improve customer service.

The image processing network is improving the division's service by enabling customer service representatives to retrieve document images instantly via on-premises workstations in order to answer customer inquiries.

The company said it is using fractional T-1 circuits on GE's corporate backbone network to link remote workstations and scanners in customer service and distribution sites in Charlotte, N.C., and Mascot, Tenn., to a FileNet Corp. optical disk jukebox system at the division's headquarters here. Personnel use the network to remotely scan images of invoices, purchase orders, shipping statements and other documents into the system.

Previously, the division microfilmed these documents, which led to delays of a week or more in retrievals of documents and the loss of about 30% of all documents due to data entry errors.

"I can't believe how much we hated it," said Lori Sollima, office technology specialist at the firm.

Sollima said the new image processing system improves customer service by enabling employees to retrieve images of shipping statements, invoices and other administrative documents virtually instantaneously. This is because document images are scanned into the jukebox as they are received and can be pulled down to remote terminals via wide-area 448K bit/sec links or to local workstations via Ethernets almost immediately.

GE said only about 2% of the documents are now lost because the image processing system enables documents to be indexed by as many as 30 different parameters, which minimizes the impact of data entry errors.

The GE division finished installing the image processing network in January 1990. Sollima declined to say how much the system cost, except that expenditures on workstations, network equipment and a FileNet Optical Storage and Retrieval (OSAR) optical jukebox system capable of

supporting as many as 64 optical disks totaled less than \$1 million.

The GE division now uses the image processing network to process images of nearly 5,000 documents a day. These images are scanned into optical disks in the FileNet OSAR, either from the division headquarters here or by personnel in Charlotte or Mascot.

For example, at the Mascot distribution center, carbon copies of about 2,000 shipping statements a day are saved and fed through a local optical scanner via 448K bit/sec wide-area links running from Mascot to Charlotte and from Charlotte into the OSAR system in Plainville, Sollima said.

Images are sent over in batches of 200 to 250. They are stored temporarily in cache memory units adjacent to the OSAR optical jukebox until employees in Mascot enter data on each image

The network enables customer service reps to retrieve document images instantly.

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that is used to file and index images stored on optical disks.

Personnel in Mascot enter this data by pulling down images of documents from the OSAR cache memory over the 448K bit/sec wide-area links and storing them on a local FileNet workstation adjacent to the scanner.

As employees go through a batch, the FileNet workstation displays images of documents on one half of the screen while the employee fills in the relevant fields of data on the other half. Once this data has been entered, images are sent from the OSAR cache memory to optical disks.

Employees in Charlotte use a similar procedure to send images of approximately 2,500 documents a day over the 448K bit/sec link to the OSAR jukebox here. Also, customer service employees in Charlotte use about 14 local FileNet workstations to retrieve images of documents needed to answer customer service inquiries. ■



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# LOCAL NETWORKING

PC AND TERMINAL-TO-HOST LANS, GATEWAYS AND MICRO COMMUNICATIONS PRODUCTS

## Worth Noting

“**W**hen OS/2 came out, I equated it to people using a chain saw to trim their hedges. There are different levels of technology appropriate for different needs.”

David Terrie  
President  
NewPort Consulting  
Scituate, Mass.

## Netnotes

A group of **Banyan Systems, Inc.** VINES users, frustrated by the lack of applications that work across large nets, last week announced the formation of the Network Applications Consortium.

The consortium's goal is to encourage application developers to build products that meet the needs of users with sites encompassing hundreds of servers and thousands of personal computers.

“We've found a lot of applications that just don't work well when you go from stand-alone to networked [environments],” said Art Beckman, organizer of the group and manager of Information Technology Services for Pacific Gas & Electric Co.

The consortium's members will offer their sites as test beds for developers working on networked applications. According to Beckman, many developers' current test sites are too small to represent the needs of users at large sites.

**PeerLogic, Inc.** announced that it will port its Pipes multivendor distributed application development environment to Novell, Inc.'s NetWare. Novell has appointed PeerLogic as a strategic partner, and PeerLogic will demonstrate Pipes in Novell's booth at NetWorld '91 in Boston next week.

Pipes for NetWare will allow NetWare Loadable Modules to connect to DOS, Microsoft Corp.'s Microsoft Win-

(continued on page 16)

## DEC's net mgmt. scheme gains NetWare LAN access

Two third-party vendors become EMA partners.

By Eric Smalley  
Senior Editor

WASHINGTON, D.C. — Digital Equipment Corp. last week announced the addition of two third-party vendors to its list of network management partners, extending the reach of its net management scheme.

DEC said it has reached an agreement with Network Computing, Inc. (NCI) of Dallas to develop a link between NCI's LANAlert NetWare network management software and DEC's DECMcc Director.

NCI will write an access module for the DECMcc management station, which is part of DEC's Enterprise Management Architecture (EMA). The NCI DECMcc Access Module will allow network administrators in a DECnet environment to monitor Novell, Inc. NetWare local-area networks.

DEC's agreement with NCI encompasses a proposal to develop as many as three LANAlert Access Modules. These modules will support different transport protocols, according to NCI President John Ferrick. The first module will support an asynchronous transport, while a second will support the Simple Network Management Protocol.

A third module, supporting Novell's Internetwork Packet Exchange (IPX) protocol, will be developed by NCI if DEC adds

support for that protocol to the DECMcc Director, Ferrick said.

DEC also signed up Technically Elite Concepts, Inc. of Hermosa Beach, Calif., to build a DECMcc Access Module. That module will give DECMcc Director access to Technically Elite Concepts' Network Professor Ethernet monitor.

When used with an access module, Network Professor will act as a front-end traffic analysis monitor to DEC's management base, said Richard Wixted, president of Technically Elite Concepts. Network Professor provides global network management by tracking all protocols and nodes on a network, he said.

NCI and Technically Elite Concepts join Ascom AG, BBN Communications Corp., Chipcom Corp., Codex Corp., Digital Communications Associates, Inc., Infonet Services Corp., Newbridge Networks, Inc., Nynex Information Solutions Group, Inc., Siemens AG, StrataCom, Inc., TelWatch, Inc., 3Com Corp., Timeplex, Inc., TSB International, Inc. and Vitalink Communications Corp. as members of the DECMcc Strategic Vendor Program.

DEC markets EMA as a manager of management systems. EMA is pitted against IBM's NetView, Hewlett Packard Co.'s OpenView and AT&T's Unified Network Management Architecture. ■

## E-mail software lets users filter incoming messages

By Eric Smalley  
Senior Editor

CAMBRIDGE, Mass. — Beyond, Inc. last week announced the development of an electronic mail application that allows users to filter and control incoming messages.

BeyondMail, which will be demonstrated at the NetWorld '91 trade show in Boston next week, is a rules-based application that provides mailbox management and application development capabilities.

The software examines the contents of incoming messages and initiates action according to users' predefined instructions, such as forwarding appropriate messages to other users and sorting out junk mail.

“BeyondMail is representative of the next generation of mail

products,” said Nina Burns, a principal at Network Marketing Solutions, a marketing consulting firm in Menlo Park, Calif.

E-mail vendors have been adding internetworking capabilities and application program interfaces to their mail transport systems, opening the way for companies such as Beyond to develop work flow management products, she said.

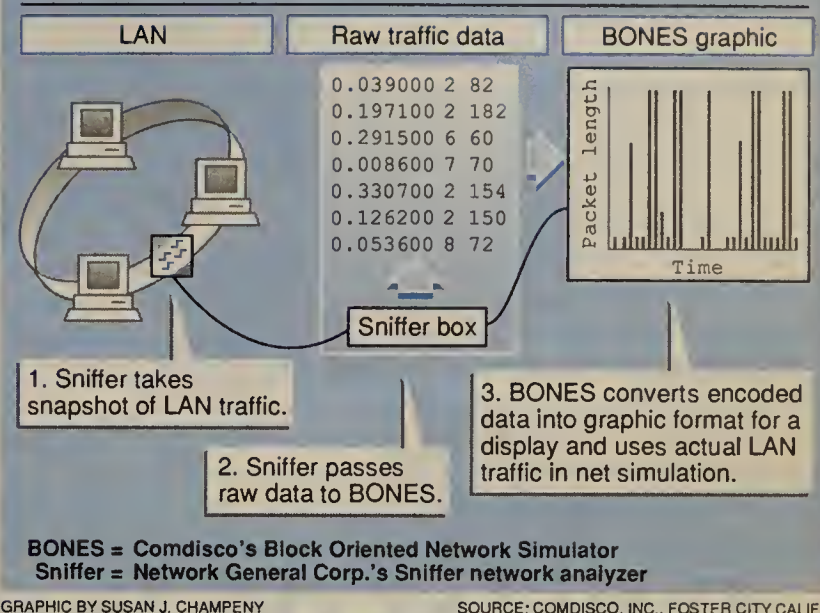
BeyondMail provides basic mail functions, including creating and sending messages, storing messages in folders and attaching files to messages, Beyond officials said.

The mail software also allows other applications, such as word processing packages, to be accessed from within BeyondMail.

The package includes a variety of

(continued on page 16)

## Cooperation between Sniffer and BONES



## Net design tool uses real network traffic

Comdisco's BONES can now import LAN traffic from Sniffer LAN analyzer for modeling tasks.

By Caryn Gillooly  
Senior Editor

WASHINGTON, D.C. — Comdisco, Inc. last week said it has enhanced its Block Oriented Network Simulator (BONES) network design tool to use actual LAN traffic statistics recorded by Network General Corp.'s Sniffer analyzer.

With last week's announcement, network administrators no longer must simulate local-area network traffic to run through network modeling and performance tests. Simulated traffic will almost always vary from actual network usage, giving administrators less than accurate configuration and performance test results.

By using actual network traffic collected by the Sniffer, the net administrator can precisely determine the most efficient network configuration.

“Over time, you can get a good overall [traffic] pattern using a traffic generator, but you can never get exact mirroring like you get with real users,” said Colin Mick, Comdisco's technical director for network products.

Comdisco plans to support connections between BONES and other LAN analyzers, Mick said. By this fall, the company intends to announce support for Hewlett-Packard Co.'s LANProbe, Novell, Inc.'s LANalyzer, as well as network management products from Bytex Corp. and Spider Systems, Inc., among others.

“We'll just go down the list,” Mick said, and provide support for the packages users request most.

BONES is software that pro-

vides a graphical environment for design, simulation and analysis of communications networks and data processing systems.

“BONES allows you to build a model of the network and run data through to simulate operations,” Mick said. “This way, you can experiment with the network without all the physical components.”

According to Comdisco, which is based in Foster City, Calif., the new Sniffer software interface will automatically convert Sniffer

“**B**ONES allows you to build a model of the net and run data through,” Mick said.

▲▲▲

data packet information — including source, destination, packet size, transmission time and Internet Protocol address — into a file that can be used by the BONES traffic generator.

Until now, users had to specify traffic conditions by using the software's traffic generator to program simulated traffic conditions.

### Cost still a factor

Analysts, who did not question the importance of network design and optimization tools, agreed that the type of ties that BONES is making to existing

(continued on page 16)



## Netnotes

*continued from page 15*

dows, OS/2 and Unix, according to PeerLogic officials. PeerLogic is developing versions for Apple Computer, Inc.'s Macintosh, as well as VMS and MVS operating systems.

**Mountain Network Solutions, Inc.**, known for its tape backup products, is expected to unveil distributed net management software at NetWorld '91 in Boston.

Mountain Data Management Software is a set of four file-handling applications. Mountain FileMan provides a graphical user interface through which users can move files, directories and virtual disks by

manipulating icons.

Mountain Connection allows users to establish peer-to-peer connections without using a file server. The application supports such protocols as IBM's Network Basis I/O System, Novell, Inc.'s Internetwork Packet Exchange (IPX), Apple Computer, Inc.'s AppleTalk and Transmission Control Protocol/Internet Protocol.

The software is scheduled to be available for DOS, Microsoft Corp.'s Microsoft Windows and Novell's NetWare by mid-year. Support for OS/2 and Microsoft's LAN Manager is scheduled for the third quarter of this year, and an Apple Macintosh version of the product is scheduled for the fourth quarter. Unix support is expected in the first quarter of 1992. **■**

## Net design tool uses real network traffic

*continued from page 15*

LAN analysis and monitoring devices would make these tools even more attractive.

However, according to Shirley Hunt, LAN industry analyst at Dataquest, Inc., a San Jose, Calif., market research firm, one of the major problems still hindering the acceptance of design tools such as BONES is price.

"Most companies would not put up the \$20,000 [for BONES]," she said, adding that most administrators have enough trouble getting the go-ahead to purchase a similarly priced Sniffer LAN analyzer.

But Hunt stressed the importance of

proper network design. "If you have 200 to 300 users on your network and it's not designed well, you can have serious problems," she said. "But the design tool has got to be limitless."

### Zero complaints

Regardless of price, users that have purchased BONES regard it highly.

According to one member of the technical staff of a large Southeastern aerospace company, which has been evaluating BONES since September, "So far, we have zero complaints."

The company runs user networks of more than 500 nodes each; therefore, flexibility and expandability are important when building a model of a growing network, said the engineer, who requested anonymity.

In one test, the company used BONES to simulate a network with 16 workstations, three Digital Equipment Corp. VAXes and other nodes, multiplied traffic conditions by 50 and hooked it all to a simulated Fiber Distributed Data Interface backbone, the engineer said.

"We didn't know if we'd break the tool or break the computer, but we didn't break either," he said. "It just wouldn't break."

The engineer added that BONES offers significantly more functionality than design tools offered under Novell's NetWare or any of the other LAN operating systems.

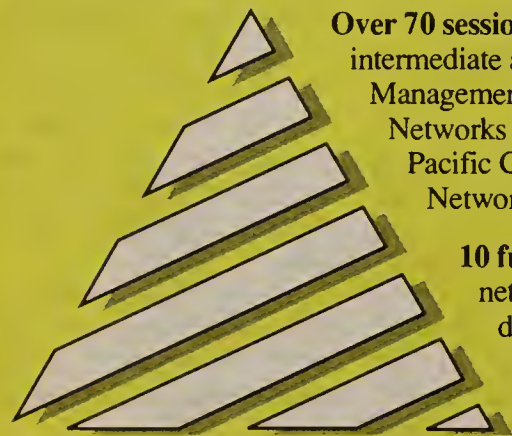
The only comparable product is another network design tool called OpNet, from Mil.3, Inc. in Washington, D.C. But even OpNet, he said, is more of a communications analysis tool than a complete network analysis tool. It just optimizes point-to-point links rather than entire network configurations.

BONES is available now for \$20,000. The package runs on Sun Microsystems, Inc. Sun-3 and Sun-4 SPARCstations and DEC DECstations in the Unix operating environment. **■**

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NWW

## E-mail software lets users filter messages

*continued from page 15*

forms in which messages can be sent.

The mailbox capabilities of BeyondMail allow users to filter, prioritize and act on messages based on content. These actions are performed by "intelligent agents" that users create with a rule editor program, Beyond officials said. The rule editor can be used to create applications such as document routing systems.

The initial release of BeyondMail will operate with the Message Handling System sold by Novell, Inc. and Action Technologies, Inc., according to Paula Berman, Beyond's director of marketing. Subsequent releases will operate with other mail transfer agents, she said.

BeyondMail will be available initially for DOS-based workstations and in character mode for Microsoft Corp. Microsoft Windows 3.0 environments. According to company officials, a native Microsoft Windows version is in development.

BeyondMail is expected to be available by midyear, company officials said. A single-user license costs \$250, and an eight-user work group license costs \$1,395.

Beyond can be reached at 38 Sidney St., Cambridge, Mass. 02139, or call (617) 621-0095. **■**



# MANAGEMENT STRATEGIES

MANAGING PEOPLE AND TECHNOLOGY: USER GROUPS AND ASSOCIATIONS

## Worth Noting

**"F**or almost all companies, communications networks are as much a competitive tool as having a modern factory building."

**Ron Brown**  
Telecommunications/  
networking consultant  
Melrose, Mass.

## Association Watch

**Timeplex, Inc.** will hold its first Users Network Conference from Feb. 27 to March 1 in Orlando, Fla. The conference is designed to give Timeplex's North American customers the opportunity to shape the company's product direction and strategies.

Timothy Zerbic, vice-president of advanced technology at Timeplex, will deliver the keynote address on "Technology Trends in the '90s." The conference will also feature discussions on network and bandwidth management, as well as local-area network internetworking and disaster recovery.

Sessions are planned for Timeplex's LINK+ multiplexers, TimePac packet switches, TimePath cell-relay products and Time/LAN internetworking Fiber Distributed Data Interface bridges, routers and concentrators. For information, contact Jo Ann Turli at (201) 573-6473.

**Service Systems International, Ltd.** recently announced the formation of the S2000 Service Management System Users Group, which held its first meeting last fall in Overland Park, Kan.

At the meeting, Service Systems unveiled Release 3.0 of the wide-area version of its S2000 for the IBM Application System/400. The software is a service management package that automates most of the daily functions of a service operation.

Service Systems can be reached at (913) 661-0190. ☐

## Survey finds some workers unclear on company ethics

Respondents split on acceptance of some gifts.

By Bob Wallace  
Senior Editor

HOUSTON — An informal survey of attendees at the recent International Communications Association (ICA) Winter Seminar here revealed that although users and vendors must abide by comprehensive codes of ethics, some of those policies are not fully understood.

A total of 71 users and vendors answered all or part of the 11-question survey, which was conducted by Mark Smith, deputy general counsel for Northwest Mutual Life Insurance Co. of Milwaukee. Smith stressed that the survey was not an official ICA undertaking.

"We wanted to give attendees an idea of where [users and vendors] stood as far as the ethics process and corporate requirements are concerned," Smith said. Respondents were not required to sign the questionnaires.

Attendees were asked if their companies have a code of ethics, set of guidelines or policy state-

ment relating to business conduct and conflicts of interest. Sixty-three respondents said their firms follow such guidelines, seven indicated they did not know, and one said no such formal program existed at his firm.

Fifty-seven attendees said their company's code or statement addresses employee acceptance of gifts, travel, entertainment, fees or compensation from firms doing business or seeking to do business with their company. Three said their guidelines address these areas, and five said they did not know.

Of those responses, 18 said acceptance of items is absolutely prohibited, while 40 said they are allowed provided they fall within certain guidelines.

Most respondents said restrictions or limitations are placed on what may be accepted in terms of type, value or quantity. Many users said they are permitted to accept items less than \$10, \$15 or \$25 in value.

(continued on page 18)

## GUIDELINES

BY WAYNE ECKERSON

## Establishing trust helps projects succeed

More than ever, network managers are being required to cost-justify every project they want to undertake. Not surprisingly, many strategic projects never get off the ground because the benefits they provide cannot easily be quantified in dollars and cents.

Projects that generate soft benefits — such as increases in productivity, enhanced customer service or improved quality — usually provide significant paybacks. Companies that fail to fund these strategic projects save money in the short term but sacrifice their long-term competitiveness.

Firms that apply technology in innovative ways often have senior executives who are visionary and willing to take risks. They know that technology, if applied properly, can position their company to be effective competitors in the long run.

Too few executives, however, have that degree of confidence in information technology. Many have been burned by technology projects in the past that have promised much and delivered little.

Not surprisingly, some executives are extremely reluctant to risk their reputations and precious corporate resources on another strategic technology scheme.

According to Bud Mathaisel, executive director of Ernst & Young's Center for Information Technology and Strategy in Boston, it all boils down to the credibility of those backing the project.

"Executives will approve projects if they trust the people behind them and those people have a good track record," said Mathaisel, who was formerly chief information officer at The Walt Disney Co.

(continued on page 18)



Bendix/King videoconferencing room in Olathe, Kan.

## Videoconferencing propels Bendix/King

Aerospace firm relies on video sessions to keep departments, suppliers and customers in sync.

By Maureen Molloy  
Staff Writer

OLATHE, Kan. — Bendix/King, a manufacturer of aircraft radios and flight instruments, is using videoconferencing to gain a competitive edge in its aerospace programs by streamlining manufacturing operations and coordinating the flow of goods from suppliers.

The use of videoconferencing allows design engineers at sites here, in Florida and the Far East to confer on an as-needed basis, giving the company a strategic edge over competitors by significantly trimming product development time.

"Videoconferencing is a breakthrough technology that's changed the way our company does business," said Larry Ehlers, General Aviation Avionics Division manager of plant engineering. "Quicker and better communications with our teaming partners, customers and vendors was the key motivation for installing videoconferencing; reduced travel was only a minor consideration."

In one instance, the network enabled Bendix/King to speed up development of a Traffic Alert and Collision-Avoidance System (TCAS) for which several airlines had asked different manufacturers to submit prototypes. The product's design was completed a year before major rivals' products, thereby allowing Bendix to capture nearly 60% of the \$1 billion TCAS market.

Ehlers said Bendix/King uses videoconferencing throughout the development phase and has begun using it to coordinate de-

sign and manufacturing operations as well.

Videoconferences are held three times a month with management teams in Singapore to coordinate manufacturing operations and to design the next generation of airborne communications and navigation equipment. Monthly videoconferences are also held between Bendix/King and its two largest customers, The Boeing Co. and McDonnell Douglas Corp.



Larry Ehlers

Videoconferencing is now used for software demonstrations for the company's data processing and maintenance departments. Finance, project and inventory reviews are also completed via videoconferences. Ehlers said this frees up time and money. While the division president previously traveled to Kansas and Florida for two separate reviews, both reviews can now be completed from a single location.

Bendix/King, a division of Allied-Signal Aerospace Co., was the first organization to install

(continued on page 18)



## Survey finds workers unclear on ethics

*continued from page 17*

Twenty-two attendees said they must file a written disclosure or report receipt of gifts, travel or fees, while 38 said they were not required to do so and four said they were unsure.

Twenty-eight said their company code of conduct permits them to accept free travel from vendors to a recreational outing at a resort where expenses of users and their spouses are paid by vendors, while 37 said they cannot take such trips.

Thirty-three said they can accept a trip to a meeting at a resort mixing business and pleasure, while 23 said they can not.

Forty-one said they can accept a trip to a business meeting or conference of users and vendors devoted to business issues, 15 said they can not, one said maybe and another was unsure.

Forty-one respondents said their company's code of conduct relating to conflicts of interest is followed at all levels of the company, while 15 felt it is not. "There is some mood out there that a double standard is being applied," Smith said.

Thirty users said their firm's code of conduct prohibits making gifts or payments to persons representing other companies with whom they do business or want to do business, while 20 said their code does not prohibit such actions and eight said they did not know. ■

## Videoconferencing propels Bendix/King

*continued from page 17*

Compression Labs, Inc.'s digital multipoint control unit (MCU), a digital device that supports manual and voice-activated switching of videoconferences involving as many as eight rooms.

Until last year, the company had been using only two-way compressed videoconferencing, in which participants left their offices and drove to another site to be part of a large point-to-point video meeting. With the MCU, people stay in their offices.

"It's the advantage of a conference call over a standard phone call," Ehlers said. "You need to talk to all the key persons in-

involved, and the interactive nature of videoconferencing allows you to do that in a way a point-to-point call can't."

Bendix/King's MCU is configured to handle five rooms and can be expanded to eight rooms on a single unit or as many as 14 sites on two MCUs cascaded together. Any MCU can also be segmented to support more than one multipoint videoconference simultaneously.

Video switching is accomplished in three different modes. The first is the voice-activated mode, where each room views the site that is speaking. When a person at another location begins to speak, the video automatically switches to the new site after a predetermined delay. To make this work smoothly, there are two adjustable time settings in the MCU.

The first is the minimum time needed for a new speaker to be recognized as dominant. The second threshold is the minimum time required between consecutive switches. Ehlers said these two parameters allow an appropriate level of give-and-take without causing quick cuts between sites.

The videoconferencing network is linked by the same T-1 network that supports voice and data among the company's six U.S. sites.

The firm has also collocated a Timeplex, Inc. Link/2 T-1 multiplexer at a US Sprint Communications Co. point of presence in nearby Kansas City, Mo.

By collocating its equipment in the carrier's central office, Bendix/King was able to use three local T-1 lines instead of the six required without collocation. Since each T-1 access line costs \$1,700 per month, the company pocketed considerable savings over the long run. In addition, collocation gives the company direct access to US Sprint's Meeting Channel videoconferencing network.

Bendix/King typically runs videoconferences at 768K bit/sec over the US Sprint Meeting Channel. For internal videoconferencing, the company generally transmits video signals at 192K bit/sec.

By combining its network with US Sprint's Meeting Channel Network and an AT&T Tariff 12 net of switched 56K bit/sec services, Bendix/King has the capability to hold multipoint conferences with more than 1,000 rooms in 25 countries through its two Kansas City connections with the carriers' networks. US Sprint's coder/decoder gateways even allow Bendix/King to hold conferences with users that have incompatible equipment. ■



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## Establishing trust helps projects

*continued from page 17*

Unfortunately, net managers don't always have the credibility with upper management to get their projects approved.

One way to overcome this credibility gap is to recruit a project champion among the ranks of top management. A gung-ho champion can lead interference for a critical project, educating executives about its strategic importance and securing the necessary funding.

Today, network managers must fight against an increasingly cost-conscious upper management that wants to slash technology budgets. Whether by cultivating a project champion or by other means, network managers must gain the confidence of top management before they can persuade them to invest in long-term strategic projects. ■



# INTERNATIONAL NETWORKS

USER STRATEGIES, INTERNATIONAL SERVICES & REGULATION

## World News

AT&T last week announced plans to expand its Global Software-Defined Network (SDN) service to Italy and Norway in the second quarter of this year and to the Netherlands in the second half of this year.

Global SDN enables users to integrate foreign locations into domestic SDNs. Users access Global SDN via direct connections to international gateway switches or virtual net services offered by foreign post, telegraph and telephone administrations. AT&T offers or plans to offer Global SDN service to Belgium, France, Japan and the U.K.

In a related move, AT&T last week said it has filed a petition with the Federal Communications Commission to let users in Canada directly access SDN services in the U.S.

International value-added network service provider **Infonet Services Corp.** last week said it does not currently have any plans to support frame relay services, even though BT Tymnet, Inc. and Sprint Data Group, two of Infonet's biggest rivals, plan to roll out extensive international frame-relay services this year.

Infonet Vice-President Mike Radice said the company is holding back partly because it is not yet clear that frame relay will have a long life span. Instead, Radice said it is possible frame relay will be superseded in the near future by other emerging technologies, such as Switched Multi-Mega-  
(continued on page 22)

## Terrorism threat results in videoconferencing demand

Firms look to technology to limit travel overseas.

By Jacqueline Emigh  
Staff Writer

WASHINGTON, D.C. — Concerned about possible terrorist attacks on U.S. citizens traveling abroad, some major corporations are curtailing international travel and increasing their reliance on videoconferencing.

Network managers said they have spotted a noticeable uptick in demand for videoconferencing services, especially to locations overseas, and at least one user said it has been approached by other companies seeking time on its videoconferencing network.

"There's no question the war has created an expanded interest in videoconferencing," said Glenn Miller, manager of worldwide videoconferencing for Upjohn Co., a multinational pharmaceutical corporation based in Kalamazoo, Mich.

Two of Upjohn's three conferencing sites are in Europe. For security reasons, Miller declined to disclose their locations.

Two major videoconferencing service providers, AT&T and US Sprint Communications Co., said they have experienced a significant rise in demand for videoconferencing services during the past month, attributable at least in part to Operation Desert Storm.

"Since Jan. 14, we've seen a substantial increase in requests from large customers for video links with offices in Paris, London, Tokyo and Stuttgart [Germany]," said Tony Jatcko, vice-president and general manager of US Sprint's videoconferencing service, Sprint Meeting Channel.

Since Operation Desert Storm began, US Sprint has handled an average of 90 requests for videoconferencing sessions per day, with about 30 being for interna-

tional services. By contrast, about 70 requests per day were received prior to the war, with approximately 10 being for international services, according to a US Sprint spokesman.

AT&T pointed to sales increases of 75% to 100% in domestic and international videoconferencing since the start of the Persian Gulf war.

At Unisys Corp., internal requests for videoconferencing doubled last month, said John Champa, chief engineer for the company's videoconferencing network. Unisys, which uses Sprint Meeting Channel, has a private videoconferencing site in Uxbridge, England, as well as 12 sites in the U.S. Also, Unisys' Timeplex, Inc. subsidiary has a videoconferencing site in Langley, England.

At Timeplex, new travel rules have gone into effect. "These rules nearly prevent any travel to any area of the international arena that we consider unsafe," said Jim Naylor, director of telecommunications for the company.

Instead, Timeplex uses Sprint Meeting Channel to communicate from the U.S. to the U.K. and uses US Sprint dial services to transmit to domestic locations.

Naylor added that he has received several requests from other companies for use of a videoconferencing facility Timeplex and Unisys share in the U.K.

Corporate executives, according to network managers, are recognizing the cost-effectiveness of videoconferencing, as well as its practicality.

"Our internal customers used to look upon videoconferencing as the best substitute for travel," Champa said. "Now many consider it better than travel." □

## Frame relay goes global

Planned international frame relay services from leading U.S. public data nets

Service provider	BT Tymnet	Sprint Data Group
<b>Domestic offering:</b> Number of nodes and cutover date	160 U.S. nodes, June 1991	More than 200 U.S. nodes, third-quarter 1991
<b>International offering:</b> Location of nodes and cutover date	U.K. and Germany, third-quarter 1991  France, Netherlands and Pacific Rim, first-quarter 1992	London, Tokyo, Nagoya and Osaka, Japan, by year-end 1991
<b>Equipment supporting service</b>	Turbo engine	TP4900
<b>Pricing structure</b>	Will include a flat-rate charge	Flat-rate, plus data volume charge

SOURCE: BT TYMNET, INC., SAN JOSE, CALIF., AND SPRINT DATA GROUP, RESTON, VA. GRAPHIC BY SUSAN J. CHAMPENY

## Frame relay holds promise for int'l nets

Technology could lower costs for global private nets, but disinterested PTTs may be roadblock.

By Barton Crockett  
Senior Editor

As frame relay products and services make their way to market, users and vendors are beginning to explore the role that frame relay could play in international communications.

Some say frame relay could eventually play a pivotal role in international nets by helping users off-load traffic to public data nets or utilize international bandwidth more efficiently. The technology could help users reduce the cost of international private lines, which are more expensive than domestic lines.

But international frame relay may also be hindered by the relatively poor quality of facilities outside the U.S. and a lack of interest in the technology by local post, telegraph and telephone administrations.

"I think people will use it in the U.S. and try to [export] it globally," said Jeremy Frank, vice-president for European telecommunications strategies at Gartner Group, Inc. in Stamford, Conn. "But the international user is really going to be in for a lot of hurly-burly because frame relay is not seen by the PTTs as strategic."

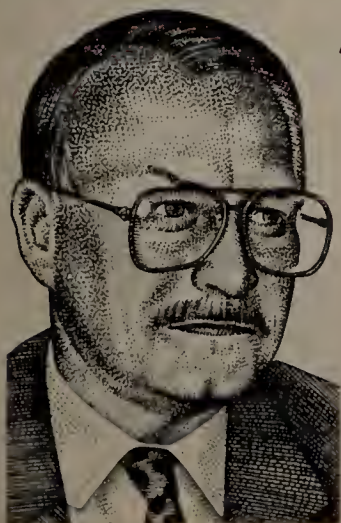
Frame relay is an emerging standard for sending packets of data between devices. It has less network delay and is able to support higher throughput than X.25 by stripping off many of the error correction and routing protocols used in X.25 transmissions.

### A public solution

According to users and analysts, one of the most important roles that frame relay could play  
(continued on page 22)

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## Frame relay holds promise for int'l nets

*continued from page 19*

in international communications is in making public data nets more viable as an alternative to private lines.

This is because frame relay enables public data net service providers to more effectively support network access at speeds ranging from 56K bit/sec to the European T-1 rate of 2.048M bit/sec. Support for high transmission speeds also enables public data net providers to better support such communications as local-area network internetworking, imaging and videoconferencing.

"International users have had a big

problem because the only way to link LANs at high speeds is by international private lines," said Gary Ragsdale, assistant vice-president at FEDEX International Transmission Corp. (ITC), a public data network provider in Memphis, Tenn. "That's very expensive. Most users would rather have a service like frame relay that lets them pool traffic on a public net at a lower cost than international private lines."

Ragsdale said FEDEX ITC plans to begin testing frame relay on its international packet net this spring. Later, the public data net operator may offer international frame relay service to its existing base of X.25 packet-switching customers.

Other public data net operators that plan to offer international frame relay ser-

vices include Sprint Data Group and BT Tymnet, Inc. (see graphic, page 19).

Jack Haverty, internet architect at Oracle Corp., said frame relay also could help international private network users because its higher throughput and shorter network delay could enable them to use international private-line bandwidth more efficiently, thereby reducing costs.

Haverty added that Oracle is considering use of frame relay on its international corporate network, which consists of nodes in Australia, Canada, France and the U.K. interconnected by multiple lines ranging in speed from 56K to 128K bit/sec.

Even though frame relay has the potential to play an important role in interna-

tional communications, many observers say the relatively poor quality of private lines outside the U.S. will deter deployment of frame relay internationally.

### Dirty lines

"I think frame relay will be adopted more readily domestically than internationally," said Thomas Jones, vice-president of marketing at Netrix Corp. in Herndon, Va., which is introducing frame relay support on its #1-ISS packet/circuit switches. "In order to be the right technical choice, frame relay requires very clean lines, and those facilities are not always available internationally."

Gartner Group's Frank added that foreign PTTs may be loath to support frame relay services because they could delay the transition to broadband Integrated Services Digital Network. Frank said foreign PTTs are targeting broadband ISDN as the most important technology of the 1990s.

But FEDEX ITC's Ragsdale disagreed. Instead, he said clean fiber-optic lines are being deployed worldwide and foreign PTTs are very interested in supporting public frame relay services as an alternative to private lines. ■

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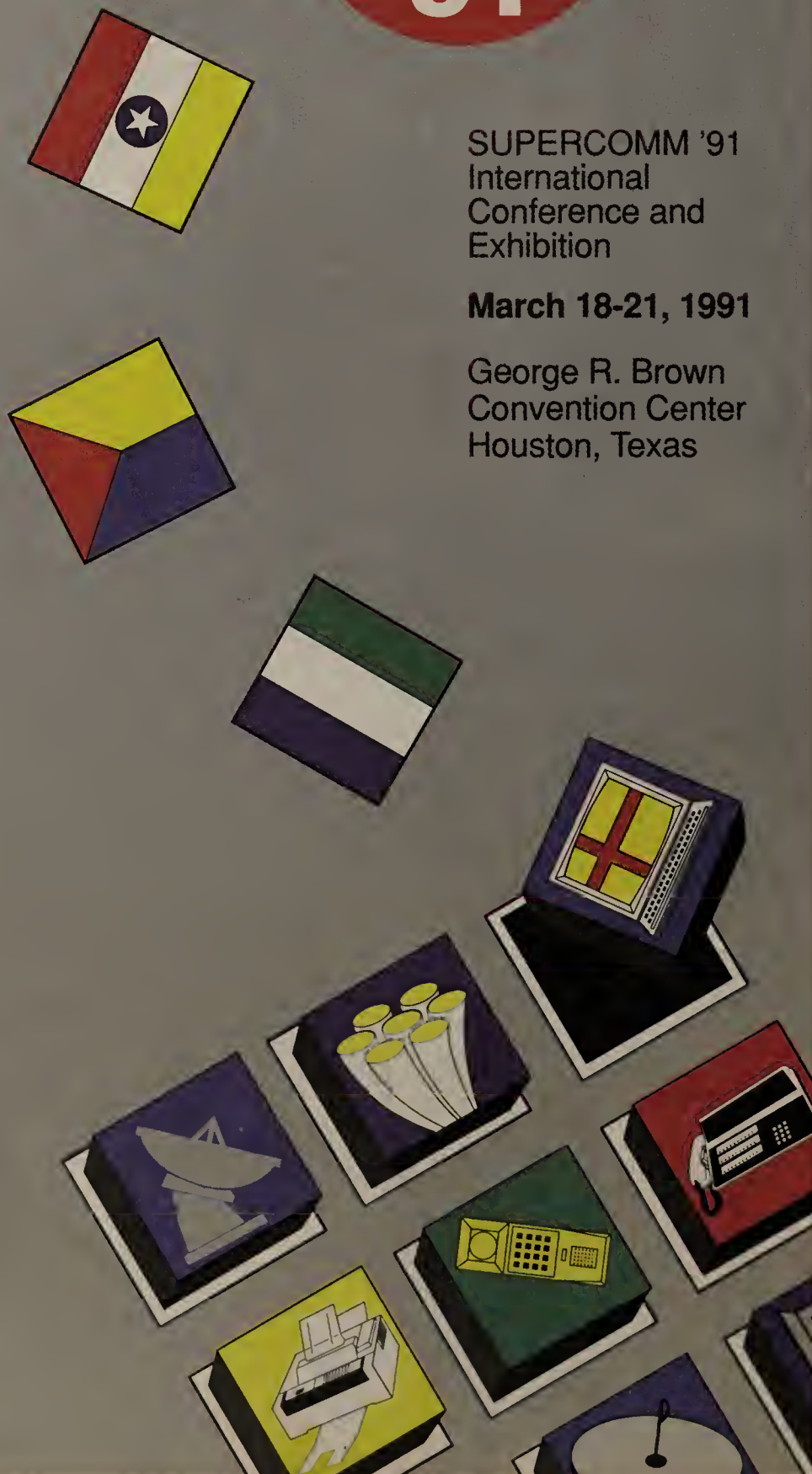
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## World News

*continued from page 19*

bit Data Service and cell relay.

Frame relay is an emerging fast packet standard that increases throughput and lessens network delay by stripping off many of the error correction and routing protocols used in X.25 communications.

AT&T recently said it is revamping the pricing for its international Pro WATS service in such a way that 76% of its customers will see price reductions averaging about 12%. Under the new tariffs, international Pro WATS users will pay for the first 30 seconds of a call and each subsequent six-second increment.

Charges were previously based on minutes. This meant, for example, that a one-minute, one-second call was billed as two minutes, while under the new program, it will be billed as a one-minute, six-second call. AT&T is also dropping the 10% discount Pro WATS users received off standard international long-haul rates, which will result in bill increases for some users.

Communications Satellite Corp.'s Mobile Communications Unit last week said T.D. Com, a European news agency based in Paris, used COMSAT's new 56K bit/sec mobile data service to cover the recent car race running from Paris to Dakar, Senegal. The news agency equipped two all-terrain vehicles with portable satellite terminals to cover the 16-day race that began on Jan 2.

T.D. Com used the service to relay audio feeds of interviews with race drivers and to transmit timing data from each rally point back to broadcasters in France.

"This capability is a major improvement over telephone, cellular and radio systems that limit the quality of the audio," said George Zachmann, COMSAT Mobile Communications' vice-president of international relations.

T.D. Com used the service to support full digital audio uplinked via satellite from a mobile terminal to the carrier's nearest earth station, where it was interconnected with the public switched network for delivery to a broadcast facility. ■



# PRODUCTS & SERVICES

THE LATEST OFFERINGS FROM VENDORS AND CARRIERS

## First Look

### Cintech adds AutoPoll to call accounting software

**Cintech Tele-Management Systems, Inc.** recently announced software that allows users of IBM-compatible personal computers to automatically transfer call detail records from remote sites to a central host over a dial-up connection.

The **AutoPoll** module is ideally suited for situations in which a company wants to consolidate call records from remote departments that are not linked to a central site.

AutoPoll works in tandem with two other modules from Cintech — **Tele-Collect** and **Tele-Report**. Tele-Collect is a memory-resident program that collects Station Message Detail Record data from a telephone switch at a remote site and stores that information on the personal computer. It retrieves the data through a port located on the switch.

Tele-Report converts the data into user-defined reports, which can include company-wide summaries, as well as detailed breakouts by department, extensions, identified number and dialed number.

The AutoPoll module provides automatic polling of user-defined remote sites and file transfer from these locations to the host.

After AutoPoll has been installed, the user at the host site can implement a DOS Edlin text editor to create a site file with instructions on the remote locations, dates and times to poll, as well as the files to be transferred.

AutoPoll comprises two components — AutoPoll Central and AutoPoll Branch. AutoPoll Central resides on the hard drive of the host computer, and AutoPoll Branch resides on the remote computer.

To run AutoPoll, the user must have a serial port and an internal or Hayes Microcomputer Products, Inc.-compatible modem on each computer.

AutoPoll Central allows the user to set the parameters for polling and file transfer. AutoPoll Branch transmits the reports from the remote sites to the host.

**Cintech Tele-Management Systems, Inc.**, 3006 Vernon Place, Cincinnati, Ohio 42519; (513) 861-2000. □

### LANStandard's software functions

Capabilities available to net administrator in Novell, Inc. NetWare LANs

Function	Element	Description
Access control	System configuration	General default information
	Directory structures	How files are archived
	Access rights	User rights to directories and files
Software control	Menu code generation	Ability to build applications menu
	Pathway implementation	Instructs client applications on disk drive locations for file server applications
	Software metering	Monitors software usage against license provisions
Workstation control	Hardware verification	Ability to tell whether workstation meets hardware requirements to run software package
	Workstation file maintenance	Ability to upload, download and update workstation files

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: PREFERRED SYSTEMS, INC., WILTON, CONN.

## New software eases task of setting up NetWare servers

Tools let user copy configuration files to servers.

By Jacqueline Emigh  
Staff Writer

WILTON, Conn. — Preferred Systems, Inc. (PSI) recently announced two software packages that promise to drastically streamline the installation and maintenance of Novell, Inc.'s NetWare network operating system across multiple servers in a local-area network.

The company's Origen program enables network administrators to enter system setup parameters in one server and then replicate all or part of the configuration file to NetWare bindery data bases on other servers across the network. Once done, PSI's LANStandard enables network personnel to maintain and modify net configuration and directory files.

Using the software, net personnel can cut NetWare server setup in a multiserver network from about a week's time to a few hours.

▲▲▲

uration file to NetWare bindery data bases on other servers across the network. Once done, PSI's LANStandard enables network personnel to maintain and modify net configuration and directory files.

Using the software, network personnel can cut NetWare server setup in a multiserver network from about a week's time to a few hours, said company President

Jack Serfass.

"Setting up file servers is difficult and time consuming," said Rick Villars, manager of computer network systems and strategies at International Data Corp., a Framingham, Mass.-based consulting firm. "Origen and LANStandard can make the process faster and easier."

Origen runs on a NetWare 286 or NetWare 386 server and enables users to automate setup procedures for new networks or add file servers to existing networks, instead of doing so manually.

With Origen, a network administrator keys in system parameters once. Then Origen modifies NetWare bindery data base files on devices located across the network. Origen manages the access control elements of system configuration, directory structures and access rights, along with three software control elements: menu code generation, pathway implementation and software metering.

To use Origen, the net operator types in a command. A main menu appears, listing several submenus. Within each submenu, the operator is prompted for information on how the network is to be configured.

By contrast, in traditional LAN configurations, users are required to pop in and out of several separate software utilities, entering and reentering similar data on each utility for every user profile on the net.

(continued on page 24)

## Tandem unleashes extensive X.400 line

Software enables users to build X.400 backbones; firm also promises to support EDI over X.400 nets.

By Jacqueline Emigh  
Staff Writer

CUPERTINO, Calif. — Tandem Computers, Inc. recently announced a suite of messaging products that enable users to build an X.400 backbone capable of supporting electronic mail traffic from the company's NonStop mainframes, as well as distributed minicomputers and local-area networks.

Tandem also announced a statement of direction, saying it intends to support the transmission of electronic data interchange documents over X.400 networks.

The X.400 product announcements will enable users to establish standards-based enterprise-wide E-mail networks so that multivendor messaging systems can exchange data across internal nets, as well as with customers and suppliers, according to Corinne DeBra, Tandem's product marketing manager.

Tandem's X.400 rollout consists of its OSI/Message Handling Systems (MHS) for its NonStop fault-tolerant systems; MHX400, which runs on the company's fault-tolerant Integrity S2 Unix-based minicomputer; and

NDX.400, a LAN-based E-mail system with an X.400 gateway to tie into OSI/MHS or MHX400.

### X.400 keystone

DeBra said OSI/MHS represents the core X.400 software that will enable users to build messaging backbones.

The software turns a Tandem processor into a store-and-forward messaging switch that can support such messaging-intensive applications as funds transfer, ordering and billing.

Tandem said OSI/MHS fully complies with the 1988 CCITT X.400 recommendations.

The software is actually a set of products that run on NonStop CLX, VLX or TXP, or Cyclone processors running the company's Guardian operating system.

The foundation Core Switching Services provide a message transfer agent (MTA) and message store services. Users can also add a gateway to OSI/MHS from the company's proprietary Transfer E-mail software or build their own gateway to link other proprietary E-mail systems.

DeBra said that running OSI/MHS on NonStop fault-tolerant

(continued on page 24)

## BT Tymnet takes wraps off low-end packet switches

By Barton Crockett  
Senior Editor

SAN JOSE, Calif. — BT Tymnet, Inc. recently introduced an entry-level packet switch that replaces its low-end Pico, Micro 3 and Micro 4 engines.

Priced from \$7,500 to \$12,000, the new PXL is based on a 32-bit microprocessor and comes with 1M byte of main memory and eight expansion slots. When fully configured, the PXL can support as many as 32 asynchronous devices or 16 synchronous devices at speeds up to 19.2K bit/sec.

Protocols supported include X.25, IBM 3270 terminal emulation, Synchronous Data Link Control and Burroughs Corp. network protocols.

According to BT Tymnet, the PXL costs about 50% less per port than the Micro 3, which supports up to 24 devices. The PXL also

costs about 50% less per port than the Micro 4, which supports as many as 16 devices, and the PXL is comparable in price to the Pico, which can support eight devices.

BT Tymnet officials said the PXL can be reconfigured much easier than the Pico, Micro 3 and Micro 4 engines.

During the next year, BT Tymnet expects to sell about 800 PXLs to users and plans to install about 400 in the Tymnet public data network, company officials said. Some analysts said users will find the product attractive for linking locations with relatively little data volume and multiple protocols into private networks.

"It's a well-engineered product and the price is good," said Jeremy Frank, vice-president of European telecommunications strategies at Gartner Group, Inc. in Stamford, Conn. □



## Tandem unleashes extensive X.400 line

*continued from page 23*

ant systems provides users with an inherent level of E-mail redundancy not found in other E-mail systems.

OSI/MHS also supports Tandem's Distributed Systems Management software, which is a set of network management and administration tools. By integrating the two, DeBra said, users can make changes to their X.400 E-mail directories and OSI/MHS can be managed from a single central network management console in a network with many MTAs spread across multiple sites.

The MHX400 software module runs on

the company's fault-tolerant, Unix-based Integrity S2 minicomputer, enabling users to position that device as a regional message switch and provide gateway services between attached client workstations and an X.400 backbone.

Several Integrity S2 minicomputers running MHX400 can be linked across different regions to provide nationwide or regional messaging. Alternatively, systems running MHX400 can be linked via X.25 lines into a corporate X.400 backbone.

Tandem's NDX.400 software runs on the company's PSX workstations as well as other personal computers. The software provides E-mail services to as many as 150 users on a LAN and provides them with a gateway connection to MHX400 or

OSI/MHS networks.

### Eye on EDI

James Lewis, manager of product marketing at Tandem, said the company expects the implementation of EDI over X.400 to take time. EDI is just now catching on, he said, and the technology is still predominantly supported over X.25, Systems Network Architecture and bisynchronous nets.

Tandem's DeBra concurred. "We see [X.400 and EDI] existing separately in the short term, but we're following the standards closely and looking at how it makes sense to integrate both in the future."

DeBra pointed to Tandem's NonStop EDI Program, in which Tandem is reselling

several third-party EDI packages, as a sign of commitment to EDI.

"The idea is to get the EDI applications going first and move them to X.400 later," Lewis said.

Tandem's OSI/MHS, MHX400 and NDX.400 are expected to be available in the fourth quarter. Monthly license fees for OSI/MHS start at \$900 for NonStop CLX systems and \$2,550 for NonStop Cyclone systems.

For the MHX400, an initial license fee costs \$14,000, while the monthly license fee is priced at \$350. The base price of the NDX.400 mail system is \$4,770.

Tandem can be reached at 19191 Vallco Pkwy., LOC 4-40, Cupertino, Calif. 95014, or call (408) 285-6000. **Z**

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## Software eases task of setting up servers

*continued from page 23*

Once network operators populate NetWare servers with configuration files by using Origen, they can install LANStandard on a NetWare server.

### LANStandard keeps watch

Once network directories and bindery files are generated across the network using Origen, network personnel can rely on LANStandard to update access, software and workstation control parameters across the network.

The software tracks system configurations, directory structures and enables network administrators to modify user access privileges (see graphic, page 23). On the software monitoring side, it features a metering capability that tracks usage of applications governed by site licenses. And for hardware, LANStandard tracks changes to hardware configurations, handles global file uploads and downloads, conducts system calls to client operating systems and provides remote maintenance of nodes.

Both programs run on Version 3.0 and above on NetWare 386, and Version 2.1 and above on Advanced NetWare, NetWare ELS and NetWare SFT.

Analysts agreed that the new products meet significant needs for configuration and network management in the personal computer LAN environment.

"This is the right tool at the right time," said Kevin O'Neill, vice-president of network research and consulting at Business Research Group, a consulting company in Newton, Mass. "As computers begin to share more data with one another on organizationwide platforms, applications will become more complex. Without a high degree of automation in network management, the only alternative is to have increasing numbers of skilled operators ride herd over network resources."

Matt Ventura, senior systems analyst at the University of Rhode Island in Kingston — a beta test site for the new software — said Origen and LANStandard have proved invaluable because students' access rights can be easily modified as they move to new on-line course materials.

Origen is expected to begin shipping in March, and LANStandard should ship at the start of the second quarter.

Pricing for the two products will be formally announced at NetWorld '91 in Boston this month.

For more information, write to Preferred Systems at 15 River Road, Suite 300, Wilton, Conn., or call (203) 761-7333. **Z**



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# OPINIONS

## FIBER OPTICS

BY JIM CAVANAGH

### An open letter to all potential fiber users

Dear Stan:

Great to see you at NetWorld! After the show, I spent some time thinking about your fiber-optic local-area network plans. That fiber seminar we attended made fiber optics seem like a great do-it-yourself project. Remember, we said they should have called the seminar "This Old LAN" instead of "Fiber Optics in Your Future."

I think you should evaluate your requirements carefully and let your needs, not the technology, be your guide as you design your new LAN. I'm not recommending that you disregard fiber optics for your LAN; there are too many benefits! What I am recommending is that you consider fiber's strengths as well as

its limitations. Here are a few thoughts on the subject:

■ **Use fiber where appropriate.** Fiber-optic LAN components are costly and are not warranted in all applications. Fiber to the desktop is ideal for very high-speed, high-cost engineering workstations. In most cases though, thin-wire or 10BaseT twisted-pair Ethernet, or token ring and Arcnet on unshielded twisted-pair wiring is appropriate for office envi-

**F**iber installation and termination is not a great do-it-yourself project.

▲▲▲

ronments. Fiber is excellent, however, for high-speed backbones.

■ **Handle fiber properly.** Don't forget that fiber strands are fragile and even the newer plastic fiber must be handled carefully — the smallest invisible fracture can impair the light-carrying capacity of the fiber. Fiber installation and termination is not a great do-it-yourself project and is best left to trained technicians, but that does not eliminate the possibility of getting one of your own LAN technicians properly trained.

■ **Don't use security as a justification.** Yes, fiber is far more secure than copper, but fiber can be compromised. Unless you are a military agency, U.S. embassy or the National Security Agency and are prepared to place your fiber inside evacuated plastic pipes with pressure monitoring equipment, security is a lousy justification for fiber.

■ **Allow extra fiber pairs.** If you need fiber now, you will no doubt be using more fiber in the future. The largest cost component in your fiber-optic network will not be the small incremental cost of additional fiber pairs; rather, it will be the cost of labor to install and terminate the fiber. Install two or three times your initial requirement and leave it unterminated. This will always pay in the long run.

■ **Specify fiber carefully.** Fiber comes in two main types — single mode and multimode — and several sizes. Specify the type, size, lengths and number of pairs of strands carefully. Also, make sure the terminating electronics can transmit a light signal over the distance specified and that they match the type of fiber specified.

(Remember Jim Camp? Last year, Jim installed more than \$100,000 worth of the wrong type of fiber-optic cable. He just didn't pay attention to details. By the way, Jim's still looking for a job if you've got an opening in your organization, Stan.)

Good luck in your fiber endeavors. Just make sure you're applying the right technology for the job and pay strict attention to details.

Your friend,  
Jim

*Cavanagh is an Atlanta-based applications engineer with fast packet provider StrataCom, Inc.*

## NETWORK WORLD

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## EDITORIAL

### FCC must resolve the AT&T dominance issue

We've said it before, and we'll say it again: The Federal Communications Commission must make a decision on the question of AT&T's competitive status in the long-distance industry.

What brings this issue to the forefront again?

The FCC is beginning its reinvestigation into AT&T's highly controversial Tariff 12 custom network arrangements. By now, you know the arguments on both sides of the issue: Proponents say AT&T must offer such arrangements to major customers or risk losing them to more nimble competitors, while opponents say the carrier shouldn't be allowed to offer Tariff 12 deals because of its tight grip on the industry.

In its court-ordered reexamination of Tariff 12, the FCC must show that the custom network packages are somehow different than their component services on some other basis than dis-

counted pricing.

In addition, AT&T's rivals have been pressing the FCC to explain an earlier ruling that they claim could derail Tariff 12 altogether. Last year, the agency, citing AT&T's dominance in the 800 services market, prohibited AT&T from allowing customers to combine usage of 800 and Software-Defined Network services in order to get bigger discounts.

Opponents want to know how that differs from giving big discounts under Tariff 12s that combine 800 and other services.

What all this shows is that the FCC and the courts will have to keep wrestling with such arcane, narrow issues until the agency decides whether AT&T is a dominant carrier that should remain subject to stringent regulation.

If AT&T is found not to be dominant, then Tariff 12 is OK. If AT&T is considered dominant, then the FCC should make clear

what a dominant carrier can and can't do in the way of custom net arrangements.

In the absence of a decision, the FCC's tacit approval of Tariff 12 and Tariff 15, for example, constitutes piecemeal deregulation. And the deregulation of AT&T is an issue that should be dealt with head-on through the AT&T dominance proceeding.

That rule making is in virtual limbo; it's unclear when the FCC will act on the dominance question. Aside from causing the spectacle of corporations and government agencies sparring over regulatory minutiae, the delay in the dominance proceeding has a major impact on users.

Tariff 12 users and other potential customers have put up with the gyrations of the regulatory process long enough. To have any confidence in their network strategies, users need to know once and for all just what AT&T can and can't do. **Z**



# OPINIONS

## NETWORK MANAGEMENT

BY MARY JOHNSTON-TURNER

### Automated integrated mgmt. best investment for tight times

As the economy slows in 1991, many network managers will face staff and budget freezes, if not outright cutbacks. At the same time, the corporate need to improve decision making, retain customers by providing high-quality service and reduce transportation costs will increase the demands on network budgets.

From frame relay to private branch exchange-to-computer links, many types of technologies and services will be offered to network managers this year. And the sales pitches will focus on improved performance at lower cost.

Many of these claims will be true; however, before embarking on any major new network transmission and switching investments, network managers must determine how well staffed and organized vendors are in delivering high-quality voice, data, video and image services to end users. The best transmission and switching technologies provide little competitive advantage if they are not managed and maintained effectively.

Companies hoping to reduce costs and improve telecommunications productivity in 1991 should begin by taking a detailed look at their network management infrastructure.

This infrastructure includes not just automated management tools, but staff levels and skill distributions, organizational structures and policies regarding how service is delivered to the end user. In many cases, it also includes a mechanism for a central communications staff to work with individual business units to implement a unified communications solution.

Vendors of integrated network management platforms

*Johnston-Turner is a principal with Northeast Consulting Resources, Inc., a Boston-based consulting collaborative specializing in management, communications and information strategies.*

have repeatedly been disappointed with users' unwillingness to rapidly embrace these tools. Users cling to their more limited, product-specific element manager systems for many reasons, only a few of which have to do with technology.

For many organizations, the issues surrounding migration to integrated management platforms are complex. To start, it is difficult in tight times to justify capital investment for nontangible productivity savings.

Furthermore, it quickly becomes obvious that integrated management places severe pres-

**A**utomated integrated management platforms will be part of the cost control/productivity solution this year.



sure on existing organizational divisions of labor and supervision — voice vs. data; local-area networks vs. wide-area networks; and Systems Network Architecture vs. distributed systems.

Each division of responsibility carries with it a well-trenched sense of turf and control. These individual groups must come to terms with the integration of the organization as a whole if they are ever to manage their network resources on an integrated basis.

There is little or no indication that telecommunications budgets will grow anywhere near the rate at which network traffic is expected to grow in the next few years. Consequently, net managers will be forced to make their organizations more productive and cost-efficient.

Investment in automated and

integrated fault management, trouble ticket, inventory and order-entry systems can reduce the amount of time network operators must spend on repetitive routine functions, opening opportunities for them to handle the more difficult issues that are coming to the fore.

In some cases, this type of investment positions the user company to outsource some management functions to a carrier or other third party while still maintaining a window on performance and service levels.

Automated integrated management platforms will be part of the cost control/productivity solution this year, but so will investment in developing a long-term network management plan and documentation of operating policies and service levels.

Identifying the most productive means for a telecommunications staff to work with its counterparts in individual business units is also critical in organizations that prize business unit autonomy.

Solidifying the infrastructure, maximizing staff productivity and outsourcing some functions to carriers or equipment-based third parties will be the best use of limited network dollars during these tough economic times.

By getting their houses in order today, network managers will be in much better shape to take advantage of the next generation of network transmission and switching technologies when capital investment dollars are freed up in the future.

By automating staff functions and maximizing staff productivity in 1991, the network manager ensures an adequate supply of people and financial resources to meet the challenges of the mid-1990s proactively. Not taking action to get your network management house in order today means that you essentially endorse a policy of disinvestment in the entire network and the business applications it supports. ■

**LIKE ALLIGATORS IN A SWAMP**, unforeseen problems can really put the bite on a communications operation. Many managers find themselves wrestling with these networking reptiles every day.

If you've survived an "alligator attack," share it with our readers by calling Susan Collins, assistant features editor, at (508) 820-7413 or fax your idea to us at (508) 820-3467. Alligators should be 1,200 words in length and submitted either on disk or via modem.

## TELETOONS

BY FRANK AND TROISE

Network Manager's Handbook:  
Rule # 74  
How to Initiate a Career Change  
Within 24 Hours:

So, Mister Chairman...  
...if you downsize the networking  
department, will you downsize  
our work load proportionately?



## LETTERS

### A wolf in OSI clothing

As a careful reading of your article "Evaluating IBM's strategy for OSI connectivity" (NW, Jan. 21) shows, IBM remains a proprietary Systems Network Architecture wolf in Open Systems Interconnection clothing despite its attempts to convince users otherwise.

IBM's OSI/Communications Subsystem (CS) product allows one to write portable applications that interoperate on a peer-to-peer basis only between IBM systems. That's because IBM provides three proprietary Application Program Interfaces (API) to access functions at the application, presentation and session layers — APIs that are available only on IBM OSI/CS systems and nowhere else.

Furthermore, IBM has explicitly chosen not to support any API for functions at the transport layer. Yet this is the layer at which the vast majority of today's peer-to-peer network applications are written on OSI and other protocol stacks, such as Transmission Control Protocol/In-

ternet Protocol and Sequenced Packet Exchange/Inter-network Packet Exchange, using such industry-standard APIs as the Transport Layer Interface (TLI).

Serious OSI software vendors that believe in open systems and in interoperability and portability of user applications support TLI as an OSI transport-layer API. IBM supports no such transport-layer API and asks users to write unportable applications using one of three proprietary APIs to other layers.

Offering the galaxy's most outrageously expensive solution for intersystem OSI file transfer and electronic mail exchange — its File Transfer, Access and Management

(continued on page 38)

Network World welcomes letters from its readers.

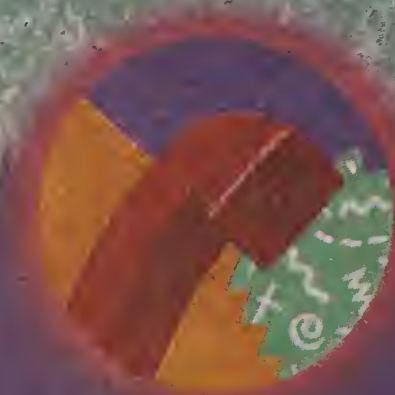
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Letters may be edited for space and clarity.



TELECOM

BUYER'S



GUIDE

## INTEREXCHANGE CARRIER NETWORK MANAGEMENT SERVICES

# Carriers strive

CONTINUED FROM PAGE 1

cused applications enhancements to their basic network management systems. As part of these offerings, carriers are creating applications software systems that coordinate and expand on underlying element management systems.

Second, carriers are designing one-terminal systems that give users total integrated access to all of the carriers' services, as well as

*Briere is president of TeleChoice, Inc., a Montclair, N.J., telecommunications consultancy specializing in long-distance service analysis and network design. He can be reached at (201) 746-0200.*

to noncarrier equipment and systems. And finally, carriers are packaging various element management systems together and marketing them as expanded or extended network management systems, following the lead of IBM, which bundled several of its element management systems and began marketing the package as NetView.

### Element management

Element management systems are generally service- or application-specific systems that allow users to manage layers of their network. In the case of equipment element management systems, the managed layer could be a specific vendor's modems. In





# for full integration

the case of the interexchange carriers, element management refers to methods of tracking long-distance service usage. The chart on page 34 shows element management systems available from AT&T and MCI.

AT&T currently offers 15 element management systems, with three more expected to be announced in the next few months. MCI now has six element management systems, with at least three more due by the end of this year.

This disparity does not imply that AT&T has three times the capability of MCI. Again, it becomes a matter of definitions.

MCI's Configuration Management and Network Information Management Services for its virtual network product, for instance, provide much of the same functionality as AT&T's Expanded Service Management System, which is a marketing package of five AT&T Software-Defined Network (SDN) element management systems. However, it's important to note that AT&T's element management systems generally cover a broader range of products than the corresponding MCI systems.

The industry is moving toward  
*(continued on page 35)*

An in-depth  
look at the  
network  
management  
services  
offered  
by AT&T  
and MCI.

## CHART • GUIDE

Buyer's Guide charts comparing interexchange carrier element and integrated network management systems begin on pages 34 and 38.



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## NETWORK WORLD

## Interexchange carrier element network management systems (continued on page 36)

Company	Group service	Element system	Products covered	Monitor/control capability	Functions covered	Hardware access options	Type of access	Nonrecurring costs (1)	Recurring costs (1)	Response interval	Graphical displays	Tariffed/contracted
AT&T Bridgewater, N.J. (800) 638-6468	Accunet Digital Services	Accunet Bandwidth Manager (2)	Accunet T1.5; Accunet Reserved Digital Services; Accunet Spectrum of Digital Services; Dataphone Digital Services; Accunet T45	Monitoring and control system	Configuration and restoration management	Any PC	Dedicated and dial-up	TBA	TBA	Within 3 min	Graphical interfaces and text	Tariffed
	Accunet Digital Services	Accunet Bandwidth Management Service (BMS); Accunet Bandwidth Management Service-Extended (BMS-E) (3)	Accunet T1.5; Accunet Reserved Digital Services; Accunet Spectrum of Digital Services; Dataphone Digital Services	AT&T network-only (BMS); monitoring and control system (4); premises-to-premises (BMS-E); monitoring and control system (4)	Configuration, performance and restoration management	BMS: ASCII terminal; BMS-E: uses ASCII terminal or customer premises equipment network management system (AT&T Paradyne COMSPHERE 6800 network management system)	Dedicated	\$513 per node controller, \$1,025 per system controller, \$113 per port	\$4,100 per system controller, \$2,665 per node controller, \$410 per port subject to Multi-Service Volume Pricing Plan of as much as 57%	Less than 1 min	BMS: none; BMS-E: graphical interfaces and text	Tariffed
	Accunet Digital Services	Accunet Information Manager (5)	Accunet T1.5; Accunet Spectrum of Digital Services; Accunet T45	Monitoring system (4)	Configuration, performance and trouble management	Any PC; AT&T Accumaster Services Workstation (6); Accumaster Integrator	Dedicated	\$2,500	TBA	For performance data: real time; for sectionalized alarms: under 5 min	Graphical interfaces and text	Contracted
	Accunet Digital Services	Customer Controlled Reconfiguration (7)	Accunet T1.5; Accunet Spectrum of Digital Services (ASDS); Accunet Reserved Digital Services	Monitoring and control system	Configuration and restoration management	ASCII terminal; AT&T Accumaster Services Workstation (8) and Accumaster Integrator (8)	Dialback	T1.5 (DS1): \$258; ASDS (DS0): \$22 to \$129 (varies by speed)	T1.5 (DS1): \$350; ASDS (DS0): \$30 to \$280 (varies by speed)	Less than 5 min	None	Tariffed
	AT&T Inbound Services	Call Attempt Profile	Readyline 800 Service; Basic 800 Service; Megacom 800 Service; MultiQuest Services; MasterLine	Monitoring system	Traffic and performance management	ASCII terminal; any PC; AT&T Accumaster Services Workstation (8) and Accumaster Integrator (8)	Dialback	\$200	\$.01 per call	1 week from end of monitored session	None	Tariffed
	AT&T Inbound Services	Customer Traffic Detail Reports	Readyline 800 Service; Basic 800 Service; Megacom 800 Service; MultiQuest Services; MasterLine	Monitoring system	Traffic and performance management	ASCII terminal; any PC; AT&T Accumaster Services Workstation (8) and Accumaster Integrator (8)	Dialback	None	None	Monthly product; real-time response available in second-quarter 1991	None	Contracted
	AT&T Inbound Services	On-line Call Detail Data	Readyline 800 Service; Basic 800 Service; Megacom 800 Service; MultiQuest Services; HICAP; International 800 Service; MasterLine	Monitoring system	Administrative, traffic and performance management	Any PC; AT&T Accumaster Services Workstation (2) and Accumaster Integrator (2)	Dialback	\$550	\$15	48 to 72 hours	None	Contracted
	AT&T Inbound Services	Routing Control Service (RCS)	Readyline 800 Service; Basic 800 Service; Megacom 800 Service; MultiQuest Services; MasterLine	Control system	Configuration and restoration management	ASCII terminal; any PC; AT&T Accumaster Services Workstation (8) and Accumaster Integrator (8)	Dialback	RCS-PCI: \$135 (9); RCS-I: none; RCS-II: none	RCS-PCI: \$500 (9); RCS-I: \$250; RCS-II: \$500; plus \$1 per min for RCS I and II after first hour	Less than 5 min	None	RCS-I, RCS-II: tariffed; RCS-PCI: contracted
	AT&T Inbound Services	Ticket Manager (10)	Readyline 800 Service; Basic 800 Service; Megacom 800 Service; MultiQuest Services; MasterLine	Monitoring system	Operations and trouble management	AT&T Accumaster Services Workstation	Dialback	None	None	Not applicable	None	Contracted
	SDN	Customer Network Administration Reports	SDN	Monitoring System	Administrative, traffic and performance management	ASCII terminal; any PC; AT&T Accumaster Services Workstation (8) and Accumaster Integrator (8)	Dialback	None	ESMS access: \$100 (11)	Administrative data available in 7 days	None	ESMS access: tariffed (12)
	SDN	Customer Traffic Detail Reports	SDN	Monitoring system	Traffic management	ASCII terminal; any PC; AT&T Accumaster Services Workstation (8) and Accumaster Integrator (8)	Dialback	None	ESMS access: \$100 (11)	Traffic data available within 24 hours	None	ESMS access: tariffed (12)

DDS = Digital data service  
DPLS = Digital Private Line Service  
ESMS = Expanded Service Management System  
INMS = Integrated Network Management System

SDN = Software-Defined Network  
TBA = To be announced  
TDS = Terrestrial Digital Service

## FOOTNOTES:

- (1) Does not include access or hardware costs.
- (2) Due in mid-1991.
- (3) Both are based on fourth-generation dedicated multiplexers.
- (4) Uses extended superframe format (ESF).
- (5) Audible alarms; immediate printing of alarm text; uses ESF; Accunet Information Manager data that customer receives is the same as in the Accunet Customer Service Center.
- (6) Due this fall.
- (7) Shared Digital Access and Cross-Connect System-based architecture.
- (8) Terminal emulation mode only.
- (9) Pricing based on current service management workstation (AT&T 6386 WGS).
- (10) Available with Inbound Management Utilities (IMU) package, which will be offered in conjunction with the Accumaster Services Workstation (ASW). There is no charge for the IMU package. IMU gives users the ability to receive reports, log trouble tickets and obtain ASW information in a newsline format.
- (11) For a single \$100 monthly fee, the customer obtains on-line access to the SDN Service Management System, DATTS, Network Remote Access Monitoring System, Customer Network Administration Reports and Customer Traffic Data Reports systems.
- (12) This system is accessed via the ESMS; this is the origin of the \$100 monthly fee.
- (13) Based on Network Control Program.
- (14) Dynamically allocated bandwidth, shared Digital Access and Cross-Connect System-based architecture; supports Nx56K bit/sec and T-1 bandwidths; T-1 accommodates standard D4 and proprietary formats.
- (15) Data retention: 8 days.

This chart shows the element network management systems of AT&T and MCI. Details of US Sprint Communications Co.'s Insite II product were not available at press time. Other interexchange carriers may offer competitive products.

SOURCE: TELECHOICE INC. MONTCLAIR, N.J.



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(continued from page 31)

integration of these element management systems, a trend that will give users cross-service control. But for users seeking to combine their equipment systems with their carrier systems, a further level of integration is required — vendor- and carrier-integrated network management systems. The chart on page 38 lists the carrier-integrated network management systems currently available from AT&T and MCI.

#### Monitoring vs. control

Element management systems enable users to either monitor or control elements of their networks. A system that allows only monitoring simply sends information about the network elements to the user but does not allow the user to directly take action on the network through the system. However, a control system allows the user to make changes, such as rerouting or testing equipment remotely, to network services. Full-featured systems offer both of these capabilities.

In fact, the necessity for providing both monitoring and control is driving much of

MCI is also developing the capabilities to include automated, intelligent routing systems that would interface with the individual element systems. MCI will offer these capabilities through its INMS product. Indeed, in the next two years, users will find greater capability to apply their carrier's network management systems to automatically respond to network crises based on preprogrammed logic.

To a degree, disaster recovery has already prompted important moves in this direction.

AT&T's Customer-Controlled Reconfiguration, Bandwidth Management Service, Accunet Bandwidth Manager, SDN Service Management System-Flexible Routing and Inbound Routing Control Services (RCS),

as well as MCI's Vnet Configuration Management, 800 Configuration Management, Digital Reconfiguration Service-Fixed Network Reconfiguration and Digital Reconfiguration Service-Dynamically Allocated Bandwidth, all allow users to set up disaster recovery plans based on network outages and other system conditions such as the time of day or day of the week.

#### Other trends

Two of the most visible network management trends in recent years have been to increase the graphical capabilities of the systems and to quicken response time.

The improvements made in graphical interfaces have been widely demonstrated at trade shows. Advances in map display of

user networks, fault situations and other network architecture-related issues have been dramatic. The same is true for response time. Determining how fast the response times are for specific capabilities is often a matter of semantics. The term "real time" is probably one of the more abused words in telecommunications today.

Data communications managers, accustomed to quick computer interactions, often measure response time in nanoseconds. On the other hand, a telecommunications manager might consider a response time of 15 minutes to be fast.

Still other network management trends include:

(continued on page 36)

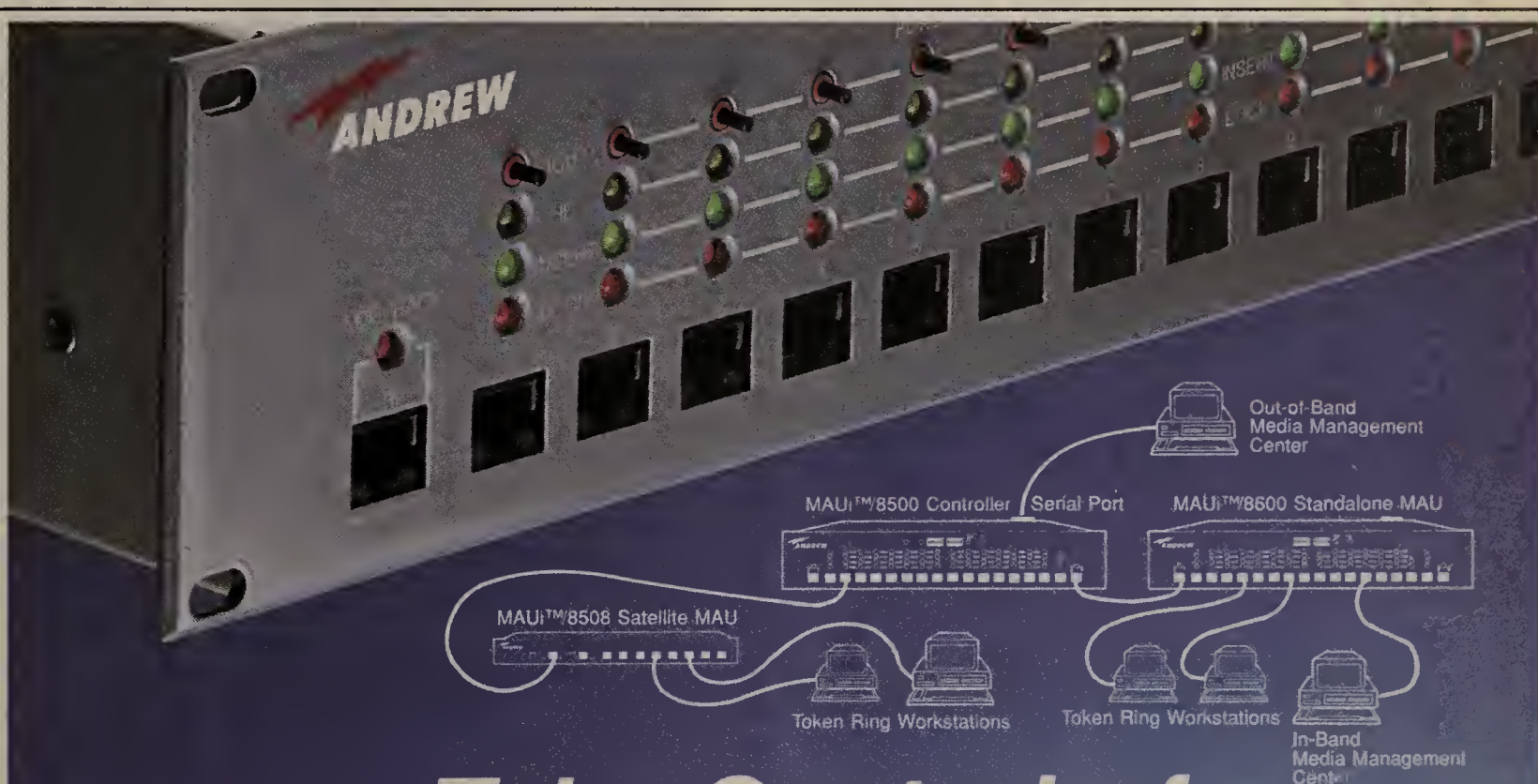
Both AT&T and MCI are incorporating automation into their network management products to enable the systems to react to information.



the current development of network management systems. Both AT&T and MCI are incorporating automation into their network management products to enable the systems to react to information. For instance, when an alarm occurs on a network, the system will accept the alarm and follow a preprogrammed logical script that will tell it how to react according to the alarm.

Accumaster Integrator, AT&T's integration tool for multivendor end-to-end network management, already allows these capabilities. Integrator users can write script programs that provide automatic response to alarms and network status levels. AT&T is also developing features that will provide users with automated response from individual element systems as well.

**Editor's note:** Detailed information on US Sprint Communications Co.'s Insite II management system was not available in time to be included in this article, which therefore focuses on the network management services of AT&T and MCI. Although many details on Insite II have already been published in *Network World* ("US Sprint preps upgraded Insite net mgmt. system," *NW*, Dec. 17, 1990), a thorough evaluation of Insite II — comparing it to AT&T's and MCI's products — will not be published until after its release.



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## NETWORK WORLD

## Interexchange carrier element network management systems (continued from page 34)

Company	Group service	Element system	Products covered	Monitor/control capability	Functions covered	Hardware access options	Type of access	Nonrecurring costs (1)	Recurring costs (1)	Response interval	Graphical displays	Tariffed/contracted
AT&T (continued)	SDN	DATTS	SDN	Monitoring and control system	Performance, trouble and operations management	ASCII terminal; any PC; AT&T Accumaster Services Workstation (8) and Accumaster Integrator (8)	Dialback	None	ESMS access: \$100 (11); DATTS access: \$100	For viewing information: real time; for status messages: within 10 min; for test results: within 24 hours	None	ESMS access: tariffed (12); DATTS access: contracted
	SDN	Network Remote Access Management System (13)	SDN (Network Remote Access)	Monitoring system	Administrative management	ASCII terminal; any PC; AT&T Accumaster Services Workstation (8) and Accumaster Integrator (8)	Dialback	None	ESMS access: \$100 (11)	For viewing information: real time; for updating information: 15 min; for exception messages: within 15 min	None	ESMS access: tariffed (12)
	SDN	On-line Call Detail Data	SDN	Monitoring system	Administrative, traffic and performance management	ASCII terminal; any PC; AT&T Accumaster Services Workstation (2) and Accumaster Integrator (2)	Dialback	None	TBA	2 min	None	Contracted
	SDN	Real-Time Network Management	SDN	Monitoring system	Configuration, trouble, traffic and performance management	AT&T Accumaster Services Workstation and Accumaster Integrator	Dialback	TBA	TBA	For traffic information: available within 5 min of call completion; for trunk status messages: within 10 min	Yes	Contracted
	SDN	Service Management System (13)	SDN	Monitoring system	Administrative and configuration management	ASCII terminal; any PC; AT&T Accumaster Services Workstation (8) and Accumaster Integrator (8)	Dialback	None	ESMS access: \$100 (11)	For viewing information: real time; for updating information: 15 min	None	ESMS access: tariffed (12)
MCI Communications Corp. Washington, D.C. (800) 289-0073	Digital Data Network Services	DRS-DAB (14)	TDS1.5; DDS-56; DPLS (2)	Monitoring and control system	Configuration, restoration and data base management	ASCII terminal; any PC	Dial-through and dedicated	T-1: \$258 per port	T-1: \$350 per port; usage: varies based on mileage and line speed, billed in 15-min increments	15 min	None	Tariffed
	Digital Data Network Services	DRS-FNR (7)	TDS1.5; DDS-56; DPLS (2)	Monitoring and control system	Configuration, restoration and data base management	ASCII terminal; any PC	Dial-through and dedicated	56K bit/sec: \$25 per port; T-1: \$258 per port	56K bit/sec: \$30 per port; T-1: \$350 per port	5 min	None	Tariffed
	800 Services	800 Configuration Management	MCI 800 Dedicated Access Line; 800 WATS Access Line; 800 Business Line	Monitoring and control system	Configuration, restoration, data base and administrative management	ASCII terminal; any PC; INMS terminal	Dial-through, dialback and dedicated	None	\$500	5 min	None	Tariffed
	Vnet	Vnet Configuration Management	Vnet	Monitoring and control system	Configuration, data base and administrative management	ASCII terminal; any PC; INMS terminal	Dial-through, dialback and dedicated	None	\$220	5 min	None	Tariffed
	Vnet	Vnet Network Information Manager System (15)	Vnet	Monitoring system	Performance, planning, operations and traffic management	ASCII terminal; any PC; INMS terminal	Dial-through, dialback and dedicated	None	\$330	Data available within 24 hours; access to that data is real-time	Yes (histograms)	Tariffed

DAB = Dynamically Allocated Bandwidth  
 DATTS = Direct Access Trunk System  
 DDS = Digital data service  
 DPLS = Digital Private Line Service  
 DRS = Digital Reconfiguration Services  
 ESMS = Expanded Service Management System

FNR = Fixed Network Reconfiguration  
 INMS = Integrated Network Management System  
 SDN = Software-Defined Network  
 TBA = To be announced  
 TDS = Terrestrial Digital Service

## FOOTNOTES:

- (1) Does not include access or hardware costs.  
 (2) Due in mid-1991.  
 (3) Both are based on fourth-generation dedicated multiplexers.  
 (4) Uses extended superframe format (ESF).  
 (5) Audible alarms; immediate printing of alarm text; uses ESF; Accunet Information Manager data that customer receives is the same as in the Accunet Customer Service Center.  
 (6) Due this fall.  
 (7) Shared Digital Access and Cross-Connect System-based architecture.  
 (8) Terminal emulation mode only.  
 (9) Pricing based on current service management workstation (AT&T 6386 WGS).  
 (10) Available with Inbound Management Utilities (IMU) package, which will be offered in conjunction with the Accumaster Services Workstation (ASW). There is no charge for the IMU package. IMU gives users the ability to receive reports, log trouble tickets and obtain ASW information in a newsline format.  
 (11) For a single \$100 monthly fee, the customer obtains on-line access to the SDN Service Management System, DATTS, Network Remote Access Monitoring System, Customer Network Administration Reports and Customer Traffic Data Reports systems.  
 (12) This system is accessed via the ESMS; this is the origin of the \$100 monthly fee.  
 (13) Based on Network Control Program.  
 (14) Dynamically allocated bandwidth, shared Digital Access and Cross-Connect System-based architecture; supports Nx56K bit/sec and T-1 bandwidths; T-1 accommodates standard D4 and proprietary formats.  
 (15) Data retention: 8 days.

This chart shows the element network management systems of AT&T and MCI. Details of US Sprint Communications Co.'s Insite II product were not available at press time. Other interexchange carriers may offer competitive products.

SOURCE: TELECHOICE, INC., MONTCLAIR, N.J.

(continued from page 35)

## ■ Cross-service coverage.

Network management systems coverage has expanded to include inbound, outbound and private-line services, and is spreading into related services such as calling cards and switched data services.

## ■ Integrated alarm management.

Systems are becoming

more fully integrated across services in order to better detect and act upon network service alarms.

■ **Interactive trouble management.** Network management designers are developing interactive trouble ticket management functions to allow users to automatically create trouble tickets upon receiving network alarms and other operational data.

■ **Host-to-host interconnectivity.** Network management systems are moving toward more interactive trouble ticket management in host-to-host communications for the large embedded base of host-based network management systems.

AT&T's main platform for integration of long-distance services is the Accumaster Services

Workstation (ASW). MCI's main platform is the Integrated Network Management Services (INMS) workstation.

AT&T's ASW offers direct access to all of AT&T's element systems for SDN, Accunet Digital Services and Inbound Services, which include both 800 and 900 services.

ASW also offers specialized

application software interfaces for some of the newer element systems — On-Line Call Detail Delivery (OCDD), Real-Time Network Management, Accunet Information Manager and the Routing Control Service.

The ASW adds functionality through these application software interfaces.

Inherent functions include



cross-service applications, such as the Call Information Manager, which takes OCDD data from different services and allows a user to perform cross-service performance and fault analysis on all of a company's usage. The ASW also includes 800 RCS planning and pretesting capabilities.

AT&T has announced the ASW. The initial service will be commercially available for SDN starting in the second quarter of 1991.

Accunet services initially will be available on personal computers in June and on the ASW in the fall, while inbound services are expected in the late second quar-

ter or early third quarter of 1991.

MCI's INMS also allows direct cut-throughs to underlying configuration, performance, trouble and administrative element systems.

INMS offers cut-through capability to underlying configuration management systems. MCI's INMS also provides specialized integrated applications software for access into advanced capabilities, including:

- **Vnet operations management**, which provides access to alarms, Call Detail Recording (CDR) data and reporting. Alarms provide user-friendly descriptions of detection criteria

and recommended action. Also, alarm correlation software delivers automatic clearances of events when the network detects a clear condition.

CDR data provides CDR search capability on all Vnet calls. Reporting provides real-time reporting based on switch-trunk statistics and based on CDR statistics.

- **INMS trouble management**, which provides interactive trouble ticketing that supports all of MCI's products and services.

- **Vnet performance and planning report**, which provides historical reporting for customer trending. INMS Version 1.0

has been commercially available since September 1990.

MCI will offer future releases of INMS, adding broader support for data and 800 services later this year.

#### Evaluating the investment

In evaluating these integrated systems, one must again differen-

For example, in the airline industry, an hour of downtime can cost millions of dollars due to the revenue-bearing nature of the network traffic.

Element management systems are rather inexpensive. You can get an entire line of AT&T SDN management products for \$100 per month plus access

**B**oth ASW and INMS can be an element system or an integration system.

▲▲▲

## Contradictions in terms

AT&T and MCI Communications Corp. articulate their respective network management system functional definitions very well, but each carrier uses its own terminology when referring to system capabilities.

AT&T has a nine-function Unified Network Management Architecture description of its approach to network management.

However, its products actually cover only five major functions of the nine — configuration management, fault management, performance management, accounting management and network planning.

By comparison, MCI has a six-pronged approach consisting of configuration management, operations management, trouble management, performance and planning management, billing and cost management, and order entry and tracking management.

The Open Systems Interconnection/Network Management Forum model represents a third view, postulating five possible net management system functions: fault, configuration, performance, security and accounting management. That may in time become the industry standard.

Even these functional definitions are not cast in stone. These terms must be taken as general indications of capability.

But customer needs are generally application-specific, such as disaster recovery, load balancing and corrective maintenance, not necessarily capability-specific as indicated by the functions above.

Any one customer application could require one or more network management functions.

Fault management represents a classic area of confusion. Greater customer requirements have spawned several branches to this category, such as restoration, trouble ticket and inventory management.

All can be related to fault management and, therefore, could possibly be listed under that category for AT&T, but they could also fit under configuration management. For MCI, which has separate trouble ticket management and configuration management functions, users also must grapple with where to fit new applications into functional definitions.

Given the changes in today's applications, the following definitions are probably appropriate:

- **Configuration management**. This provides the ability to monitor and reroute on a dynamic basis to meet changing needs.

This provides information concerning the present operation of the system, including network alarms. It also ties into restoration management in disaster situations.

- **Trouble management**. This provides trouble ticket management functions in the case of line problems, and historical analysis of past trouble ticket problems and their resolution.

- **Administrative management**. This allows general administrative chores, file indexing and transfer, system configuration, security access and administrative messaging via E-mail.

- **Billing management**. This provides information concern-

**F**ault management represents a classic area of confusion. Greater customer requirements have spawned several branches to this category.

▲▲▲

It allows on-demand allocation of bandwidth, preprogrammed configuration diagrams based on traffic patterns, electronic mail to configuration management center personnel and so on.

- **Restoration management**. This is related to — but different from — configuration management. The restoration management function tracks disaster recovery plans and other plans that have been preprogrammed to be executed when a line outage or other disaster occurs.

- **Data base management**. This provides the user with a means to update and maintain the basic logical information contained in the user's data bases that define the network.

- **Operations management**.

ing present bills due, billing formats, alternative billing methods, hierarchy definitions and bill delivery specifications.

- **Inventory/provisioning management**. This provides information concerning services inventory, order entry, order status and delivery dates.

- **Traffic management**. This provides information on present traffic patterns, via real-time transmissions, and past traffic patterns, allowing trunking analysis, cost performance data analysis and so forth.

- **Performance management**. This provides information and reporting on present performance, via real-time transmissions, and historical trends in net performance. □

— Dantel Briere

tiate between capability and applications.

Both element and integration systems can have the same capability, making it tough to decide which level to buy. At times, both ASW and INMS can be an element system or an integration system because they have features of both.

For instance, if a user wanted to purchase cross-service trouble ticket management from MCI, the carrier would sell the user its product, INMS.

In that sense, INMS is an element system for cross-service management, which also meets the definition for integrated carrier management systems.

Part of the overall challenge in evaluating network management systems is cost-justifying the investment.

This requires both identifying the user network management system application and having the user determine the cost of network downtime.

costs. MCI's equivalent, Vnet, is \$220 per month, plus access charges if required.

#### Future development

While some of the trends influencing the development of the carrier portion of the interexchange network management systems are clear, others are just starting to crystalize. Users' migration from private networks to public network services is creating new challenges for network management system vendors.

Many of the basic performance parameters of switched data services are not yet determined. Age-old private network constructs such as "availability percent" — the percentage of time that a net is available for calling — have no meaning in a switched data environment. New measurements must be defined.

Also, users are expected to continue to migrate to multi-carrier environments. To do this, (continued on page 38)

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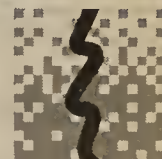
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## Interexchange carrier-integrated network management systems

Company	Product	Inherent management functions	Element systems accessible	Access platform	Nonrecurring costs (1)	Recurring costs (1)	Graphical user interface	Tariffed/contracted	Comments
AT&T Bridgewater, N.J. (800) 638-6468	Accumaster Integrator	Administrative, trouble, configuration, performance, traffic, data base and operations management	Direct cut-through: CNAR, CTDR, DATTS, NRAMS, SMS, OCDD, BMS, BMS-E, AIM, CCR, RTNM, RCS, Ticket Manager and Call Attempt Profile; applications software interface: OCDD, RTNM, AIM, RCS	Sun Microsystems, Inc.'s SPARCstation, plus server (AT&T's 3B2/600 or Sun SPARCserver)	\$180,000 to \$350,000 (including hardware) (2)	None (2)	Yes	Contracted	Inherent functions include Accumaster Services Workstation capabilities (3), plus automatic scripting capacity
	Accumaster Services Workstation (3)	Administrative, trouble, configuration, operations, traffic and performance management	Direct cut-through: CNAR, CTDR, DATTS, NRAMS, SMS, OCDD, BMS, BMS-E, AIM, CCR, RTNM, RCS, Ticket Manager and Call Attempt Profile; applications software interface: OCDD, RTNM, AIM, RCS	Sun SPARCstation	\$1,000 to \$10,000 (2)	None (2)	Yes	Contracted	Inherent functions include cross-service applications; Call Information Manager, which takes OCDD data from services; improved graphical display; 800 RCS planning and pretesting capabilities; cross-service performance and fault management
MCI Communications Corp. Washington, D.C. (800) 289-0073	Integrated Network Management System	Trouble ticket management (supports all MCI services); operations management: Vnet, 800 and private line; performance management: Vnet, 800 and private line; administrative, planning and configuration management	Vnet Configuration Management, 800 Configuration Management, Digital Reconfiguration Service	IBM PS/2	None (2)	\$220 to \$2,500, depending on modules selected (2)	Yes	Tariffed	Inherent functions include cross-service applications; data retention: 4 days to 13 months (raw CDR held for 4 days; CDR reporting available for 30 days to 4 months; alarms and traffic information held for 4 months; trouble tickets held for 13 months)
	MCI View	Operations management	Not applicable	IBM 3278 terminal	\$500 to 1,000	\$275 to \$425	Yes	Tariffed	Not applicable

AIM = Accunet Information Manager  
 BMS = Accunet Bandwidth Management Service  
 BMS-E = Accunet Bandwidth Management Service-Extended  
 CCR = Customer Controlled Reconfiguration  
 CDR = Call Detail Recording  
 CNAR = Customer Network Administration Reports  
 CTDR = Customer Traffic Detail Reports

DATTS = Direct Access Trunk Test System  
 NRAMS = Network Remote Access Management System  
 OCDD = On-line Call Detail Data  
 RCS = Routing Control Service  
 RTNM = Real-Time Network Management  
 SMS = Service Management System

## FOOTNOTES:

(1) Does not include access or hardware costs.

(2) See the Interexchange carrier element network management systems chart on page 34 for costs of the individual element network management systems.

(3) Available in second half of 1991.

This chart shows the integrated network management system products of AT&T and MCI. Details on US Sprint Communications Co.'s Insite II product were not available at press time. Other interexchange carriers may also offer competitive products.

SOURCE: TELECHOICE, INC., MONTCLAIR, N.J.

(continued on page 37)

users face the challenge of managing all the different carriers without having to invest in separate systems for each one. However, both AT&T and MCI say that they will not be interconnecting

**A**T&T and MCI say they will not be interconnecting anytime soon.



with each other's systems anytime soon.

**Baby Bells bottleneck?**

A big problem facing both carriers is visibility outside of their networks — into the local loop for network management performance data, for instance.

The regional Bell holding companies are just starting to develop Open Systems Interconnection-based network management systems that will be able to pass such information to the carriers. Lacking this information, the carriers must rely on customer premises equipment-based network management reporting to create

data for a customer premises equipment-to-carrier point of presence transmission segment.

For instance, MCI is approaching this problem in two ways. First, it is monitoring dedicated access lines from its switches to identify situations such as out-of-service conditions and unusual calling patterns.

MCI has implemented extended superframe format (ESF) monitoring, which allows the carrier to identify performance-affecting conditions ("A larger frame of reference," *NW*, Sept. 24, 1990). AT&T does the same but has installed end-to-end ESF monitoring throughout its network.

Some of the alternative access carriers, such as Metropolitan Fiber Systems, Inc. and Teleport Communications Group, are opening their network management centers to access by the carrier network management centers, giving the interexchange carriers a view into the local loop.

On the international side, the problem is much more complicated. The carriers have no control over the type of information a foreign post, telegraph and telephone administration generates. However, movements are under way to standardize international network management data formats; the June 1990 OSI Network Management Forum developed a set of specifications for such information.

However, international connections from the specifications are not expected until at least 1992. Even when they become a reality, the carriers are unsure that all of the information they require to drive their network management systems will be available.

In any case, the future will see more application-specific network systems. AT&T appears to be more intent on developing a set of network management systems for specific applications, particularly for inbound services. The carrier is expected to announce more telemanagement

**T**he future will see more application-specific net systems.



products later this year. MCI is also working to segment its products to reflect application lines. The carrier plans to provide additional functionality for the data and inbound services.

However, the basic human interactions the network management systems require will gradually change. Users are expecting

the carriers to handle more and more network management system functions automatically. There should be no need for a user to reconfigure lines to avoid a cut fiber-optic cable; the network should automatically re-route around the problem and

keep it from affecting the user.

This is not the reality of today's network. But as the net becomes more intelligent, it will absorb many of the basic network management system functions and concentrate on the more advanced needs of users. ■

**Letters**

*continued from page 29*

(FTAM) and X.400, respectively — does not make IBM an open systems company.

Eugene Shklar  
 Director of marketing  
 Network Products Division  
 Oracle Corp.  
 Redwood Shores, Calif.

**Another point of view**

If there is decreasing impact on business direction and strategy from senior information systems (IS) executives and heads of MIS departments, perhaps a clue can be found in the article, "Study: Top IS execs align technology, business tasks" (*NW*, Dec. 31/Jan. 7).

As an exercise, the senior IS executives of large North American corporations polled by Index Group, Inc., whose concerns were summarized in the chart "Top issues facing IS management" on the front page, might want to consider reviewing their ranking of the top 15 issues from the perspective of a chief execu-

tive officer or chief financial officer.

Most CEOs would rank the No. 1 issue, "Reshaping business process through information technology," differently. They would probably rank "Aligning IS and corporate goals" first.

In addition, they would probably consider "Utilizing data," "Using IS for competitive breakthrough," "Cutting IS cost" and "Connecting to customers and suppliers" more important than did the IS executives.

Many of the other issues, such as improving leadership, human resources, boosting productivity, integrating IS and improving quality, are commendable and are the same skills required for effective management, regardless of position or function in the organization.

When the focus of IS or MIS supports the core business and business strategy, acceptance and contributions grow.

Raymond Kane  
 Marketing consultant  
 Marketing Results  
 Silver Spring, Md.



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# When ROLM sent John Axselle back to school, he asked questions that got a whole campus talking.

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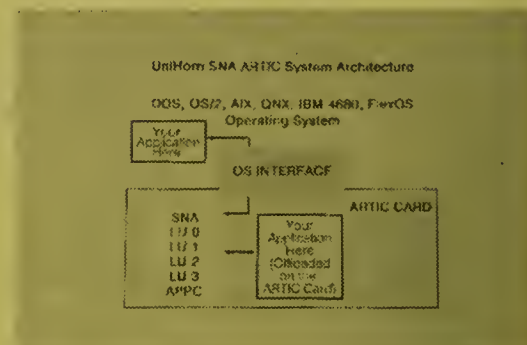
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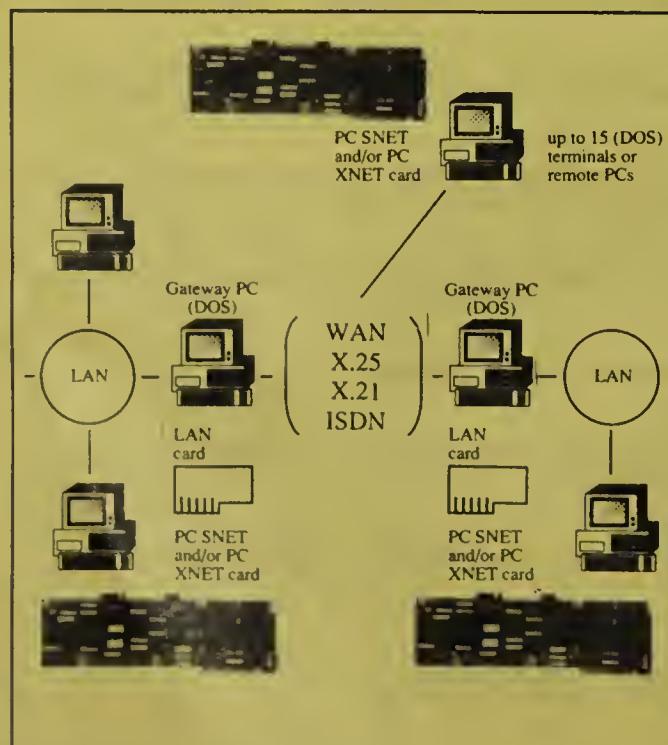
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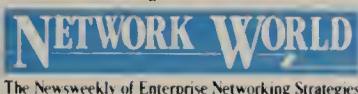
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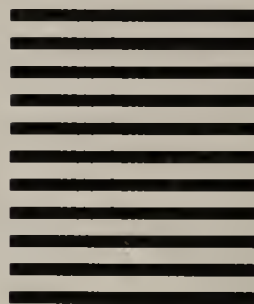
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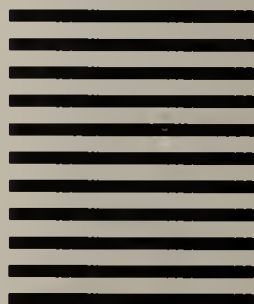
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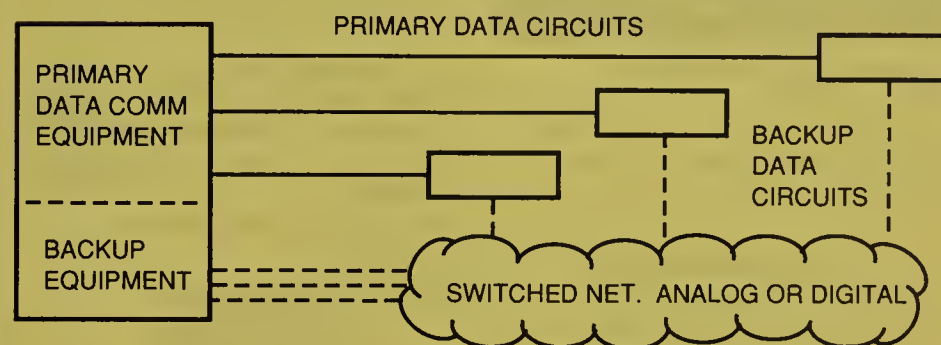
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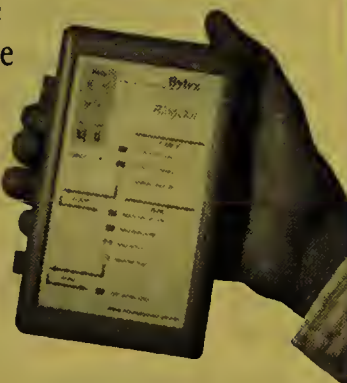
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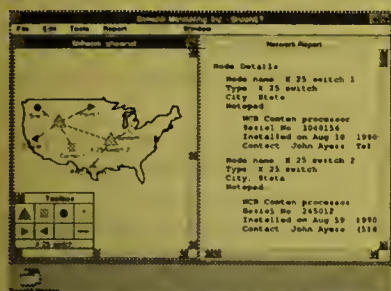
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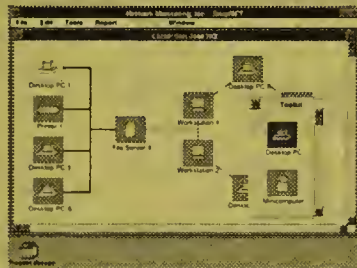
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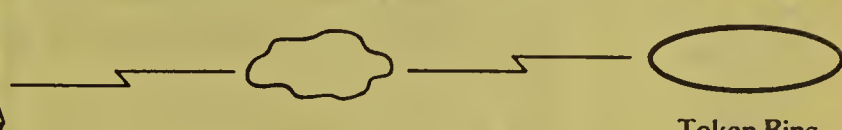
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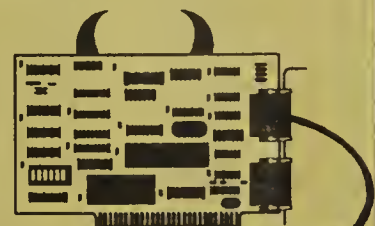
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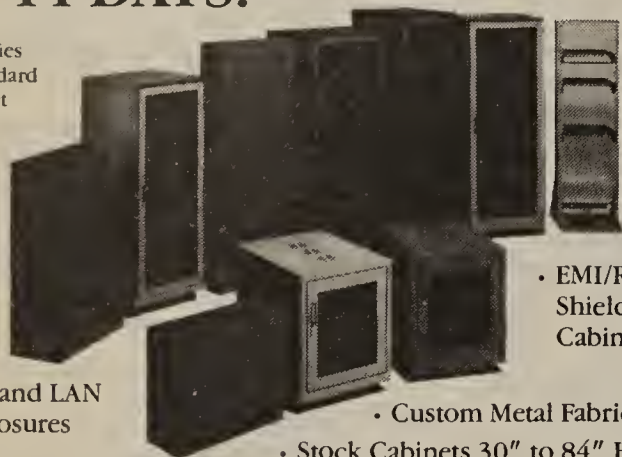


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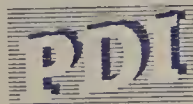
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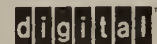
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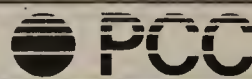
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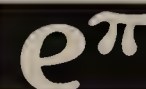
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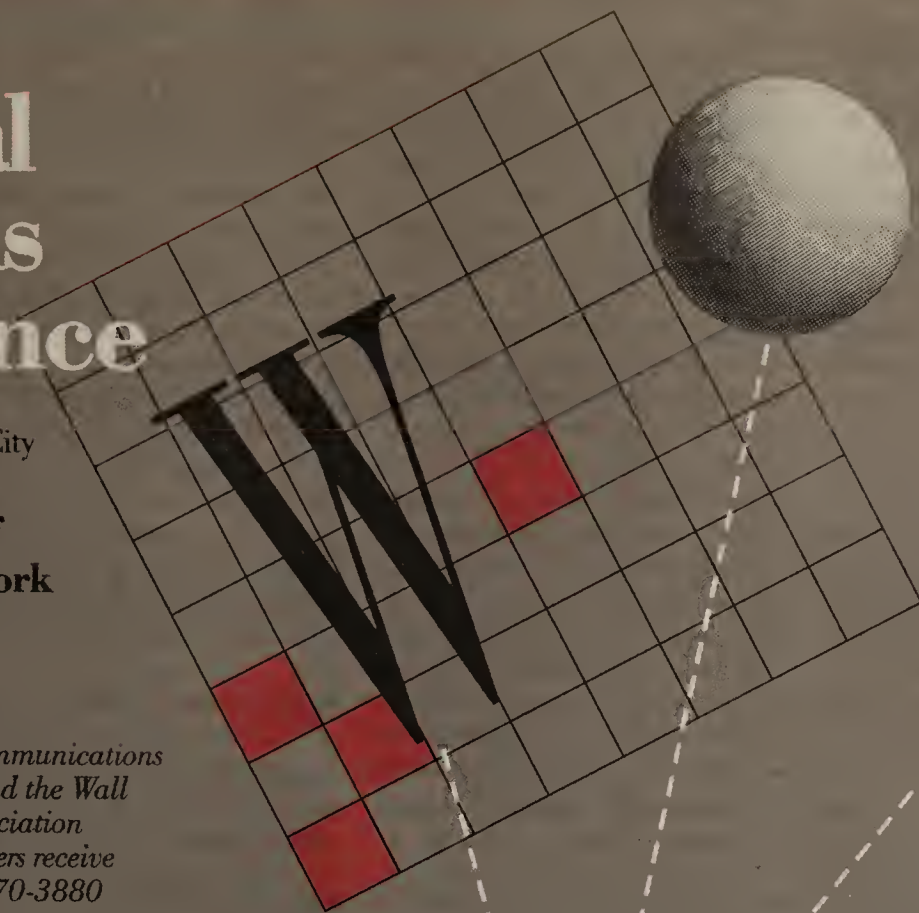
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## IBM to bring OS/2 into APPN fold

*continued from page 1*

to communicate with any other, he said.

Once APPN is available for OS/2, IBM will roll it out on mainframes and the RISC System/6000, McGee said. However, he would not commit to a timetable for support of APPN on mainframes. Host support, pieces of which were announced last September, will be phased in.

According to McGee, APPN offers three main benefits: the ability to dynamically add or remove nodes to a network; enhanced directory functions; and enhanced routing.

There are two node types defined under APPN — network nodes and end nodes. Network nodes maintain a full directory of devices and can route traffic to any other node. End nodes do not support directories but can request routing information from a network node.

A third node type, a Low Entry Network (LEN) node, is synonymous with PU Type 2.1 nodes. LEN nodes can talk to other LEN nodes as peers — without the aid of VTAM in the host — but do not support routing. Like end nodes, LEN nodes can use network nodes to route data.

LEN nodes cannot be dynamically added or removed from a network without manual intervention to update routing tables, the factor that differentiates LEN nodes from APPN nodes.

Numerous IBM processors support LEN today, including the Application System/400, OS/2 Extended Edition devices, System/36, System/38, Series/1, System/88, RT Personal Computer and its DOS-based Personal Computers.

VTAM in a host, along with the Network Control Program (NCP) running on a front-end processor, can constitute a single LEN node.

Only the AS/400 and Sys-

tem/36 minicomputers currently support full APPN capabilities.

McGee said the addition of APPN to OS/2 will be a boon for users interested in developing client/server or distributed applications because it simplifies networking. Today, VTAM and NCP make all Systems Network Architecture routing decisions and have to be manually configured to recognize each physical and logical unit in the network.

Under APPN, routing functions are handled by network nodes independently of VTAM and NCP. They can access hosts if those machines are configured as Type 2.1 LEN nodes. APPN net-

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**O**nly the AS/400 and System/36 minicomputers support full APPN capabilities today.

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work and end nodes can also be added to or removed from the network dynamically.

### API plans

In its effort to help users develop client/server applications, McGee also revealed last week that IBM plans to ship this year an OS/2 Application Program Interface (API) to LU 6.2, the transport mechanism for all applications under APPN and LEN.

Today, interfaces to LU 6.2 differ by operating system. To remedy that, IBM in 1987 announced a statement of direction to develop the Common Programming Interface for Communications (CPI-C), a common API to LU 6.2 for its major operating systems. The company said it will

develop CPI-C for the four Systems Application Architecture platforms: VM, MVS, OS/400 and OS/2.

So far, it has shipped only one — for VM — although CPI-C for MVS was announced in September and McGee said it will ship this year for OS/2. CPI-C for operating systems such as OS/400 and AIX are in the works.

### CPI-C with APPN

When both CPI-C and APPN are supported under OS/2, users will be able to build APPN networks within larger SNA nets. Communications from an APPN net to a mainframe would be supported via LU 6.2 connections and made easier, thanks to VTAM and NCP enhancements announced in September.

Those enhancements include a multitail feature that lets any node connect into multiple NCPs. That gives devices more options for routing data.

Also announced in September was dynamic logical unit definitions in VTAM. That lets a node establish an LU 6.2 session with a host, even if that logical unit was not previously configured in VTAM. This marks the beginning of dynamic configuration for mainframe-based SNA nets, although it applies only to LU 6.2-based logical units.

OS/2-based devices outfitted with APPN could be dynamically added or deleted from a network without manual intervention only so far as other APPN nodes are concerned, McGee said. If the devices need to communicate with the host, they still have to be configured in VTAM and NCP.

That will change only when IBM gives VTAM and NCP support for APPN. Given the massive installed base of mainframe-based networks, McGee said IBM has to consider carefully how it rolls out APPN mainframe support and migrates users to it.

He declined to say when that migration will begin. ▀

## ACD routes calls to home agents

*continued from page 2*

PBX, which passes the call to the voice processing system. The software designates an analog port on the PBX and notifies the switch that the agent is ready to receive calls.

Incoming calls are routed over telephone lines to the agent's home, but the agent must have a second line to receive customer profile data from the host.

Performance statistics for home agents, including the number of calls handled and call duration, are recorded by the same AT&T call management system used to monitor performance of call center-based agents.

### Management issues

"[Home Agent] is something we are considering but not in the short term. We have to decide how we would monitor and manage agents at home," said Todd Benton, operational vice-president for Directel, Inc., a Westerville, Ohio, direct marketer with customers that include Procter & Gamble Co., Random House, Inc. and the American Automobile Association.

Home Agent, which supports 36 agents, is expected to be available in the second quarter of this year for \$30,000.

Also last week, AT&T announced SNMP support for its Accumaster Integrator network management system. AT&T has published a document detailing how to map SNMP alerts into the Integrator Alarm Interface specification.

The Integrator will support

only monitoring of devices via SNMP but will provide a terminal-emulation feature to let an Integrator operator control an SNMP management system.

AT&T Computer Systems, Automated Network Management, Inc., Kaptronix, Inc., Netlabs and Network Computing Devices, Inc. said they will support the SNMP link.

AT&T also said it has completed trials of its Accunet Information Manager (AIM), its private network management service, and will make the offering generally available in June. AIM, personal computer software that monitors Accunet T1.5 circuits, helps users spot problems before line failures occur. AIM has been in trial with more than 30 users.

Separately, DEC announced a gateway that will link AT&T Definity Generic 2 PBXs with VAXes running VMS. The product, called DECagw, is a set of software programs that run on DEC VAXes.

Integrating Definity Generic 2s through the gateway with DEC VAXes will enable users to speed processing of incoming and outgoing calls in telemarketing, customer service and order entry applications.

In 1989, AT&T and DEC announced plans to develop a PBX-to-host application interface based on AT&T's Adjunct/Switch Application Interface and DEC's Computer-Integrated Telephony platform.

DECagw will be generally available in March at \$50,000 per PBX link. Annual maintenance will be priced at 15% of that cost.

*Senior Editor Paul Desmond contributed to this story.*

## Touch pack to aid OSI efforts

*continued from page 9*

Corp., Sprint International, Telecom Canada and the public telephone companies of France, Italy and Japan.

Alliance is supplied on tape and consists of source code that can be loaded onto any computer with a C-compiler. To integrate a device into the system, the programmer uses Abstract Syntax Notation .1, an object-oriented language. The programmer then uses the C-compiler to create a program that specifies the characteristics of the elements to be managed by the OSI system.

Elements consist of managed devices and management systems for the devices, such as proprietary modem management or front-end processor management systems. Characteristics are properties that describe the elements. Characteristics of a bridge, for example, would include a throughput and forwarding rate. The MCS module establishes associations between the elements and the net management applications.

The system agent uses a special feature — an event discriminator — to keep track of alerts and other events emitted by the elements and to report them to the protocol stack.

"The provision of the event discriminator is extremely significant," Marks said. "Any OSI network management process is going to require this kind of capability."

Although Alliance signifies the arrival of a new era, OSI network management will pose its own challenges, Herman cautioned. "Over the next few years, suppliers will converge on the approach to obtaining network management data but distinguish themselves by what they do with the data — how they process, store, display and report it.

"This will create a more complex environment," Herman said. "To avoid redundancy, customers will have to become more sophisticated in analyzing how network management products fit together."

Alliance OSI Management software is priced at \$10,000 to \$50,000 per system, depending on configuration. ▀

## MCI to act as int'l go-between

*continued from page 6*

Telecom and KDD, provide users with private international networks via dedicated connections to Commax nodes in the U.S., U.K. and Japan.

In addition to acquiring groups of lines to multiple countries for users, MCI will be able to order private lines within a foreign country or between two or more foreign countries, according to carrier officials.

MCI added that it will also work with foreign carriers to house and maintain a user's equipment on the carrier's premises. In addition, MCI and foreign carriers will implement customized procedures for responding to and fixing network trouble reports. Users will also

receive a single point of contact for reporting outages.

All of these services can be bundled into a single bill with charges denominated in a user's preferred currency.

### First customers

MCI officials said they plan to sign up six to 20 GCS customers this year. The carrier said Visa International, Inc. has already signed up for the service. MCI is supplying Visa with about 50% of the international circuits used to connect VisaNet hubs on the East and West Coasts of the U.S. to VisaNet nodes in Europe and Asia, according to MCI.

Visa is also collocating multiplexers in Infonet facilities in Europe ("Visa to farm out control of int'l hubs," *NW*, Jan 28). Infonet Vice-President Michael Radice said Visa is getting billed for In-

fonet services via MCI.

A top MCI official admitted, however, that the Visa deal is a limited GCS implementation because Visa negotiated separate contracts with MCI and Infonet.

Even though MCI officials said customers want one-stop shopping, some users said it is a bad deal. This is because they have found one-stop shopping actually increases carrier coordination problems and network outages. Others said one-stop shopping lessens a user's influence on a foreign post, telegraph and telephone administration.

"We like to place the order locally [with a foreign PTT] because we can build a relationship that helps us in the long run," said John Bischoff, manager of telecommunications planning at American President Systems, Ltd. in Oakland, Calif. ▀



## Cisco turns AGS into SNA router

*continued from page 1*

employed at roughly one-third the cost of a front-end processor."

SNA will become the 16th protocol supported by Cisco Systems' bridge/routers.

Vitalink Communications Corp. last week announced a similar agreement with Netlink, Inc., an SNA software house in Research Triangle Park, N.C., that will give Vitalink bridge/routers the ability to route SNA data. But Vitalink said its bridge/routers will emulate PU Type 2 devices, such as cluster controllers, which cannot route data.

Andrew Greenfield, product line manager for token-ring internetworking at Vitalink, said the bridge/routers will still have the intelligence required to route SNA data, although he declined to detail how that would work or when it would be available.

Although Cisco Systems announced the SNA routing capability only last week, the company said development with Brixton has already begun and the capability is about a year away from delivery.

In the interim, Cisco Systems last week formally rolled out its Synchronous Data Link Control transport software. That product enables Cisco Systems' bridge/routers to support direct attachment of devices, such as cluster controllers, so that SDLC traffic

can be carried on the same backbone with other local-area network protocols ("Router firms to support SDLC traffic," *NW*, Dec. 10, 1990).

Cisco Systems' SDLC transport software supports only point-to-point connections so that a cluster controller, for example, always communicates with the same front-end processor. The new front-end emulation capability will go beyond that by enabling a single personal computer emulating an IBM 3270 terminal, for example, to support connections to multiple hosts, said James Morris, vice-president of marketing at Brixton.

Cisco Systems also announced its intention to give its bridge/routers support for IBM's PU Type 2.1 nodes, although it said that capability would not be available for some time. When PU Type 2.1 support ships, it will enable intelligent workstations that support IBM's LU 6.2/Advanced Program-to-Program Communications protocol to communicate directly with other devices that support APPC without passing through a VTAM host.

LU 6.2 support will give users an option other than IBM's source routing for linking LAN-attached devices. Source routing is considered to have limitations in large networks.

When installed in an SNA net, the Cisco Systems routers will attach to 3X74 cluster controllers or host-attached 37X5 front-end processors, Morris said. The

bridge/router provides the network connection, which can be T-1 or T-3. In addition, any type of LAN media can attach to the bridge/router on the local side.

Analysts said SNA support is the next challenge bridge/router firms face in trying to give users a single multiprotocol backbone.

"This is technically a much better approach" than SDLC transport, said Jeremy Frank, a vice-president with Gartner Group, Inc., a consultancy in Stamford, Conn. "It's a nice, flexible utility."

Wellfleet Communications, Inc. also offers a capability called Synchronous Pass-Through that is essentially the same as Cisco Systems' SDLC transport software. Wellfleet last week said it is looking at the issue of SNA routing but did not have a definitive product plan to discuss.

Jerry McDowell, vice-president of education and consulting at the META Group in Westport, Conn., said Cisco Systems would get an edge on the market if it meets its delivery dates.

"If they actually do [SNA routing], they're going to have such a jump on everybody else that I think the market will belong to them," McDowell said. He added that Vitalink's lack of detail is an indication that its development effort is not very far along.

Both Cisco Systems and Vitalink announced an intention to deliver software that would let their products be managed by IBM's NetView. **■**

## IBM, DEC deal with Novell

*continued from page 1*

search firm, agreed. "From formerly reticent conclaves at DEC and IBM, there's recognition that they've got to include NetWare as a key component of their LAN strategies," he said.

The relationship between IBM and Novell will include product introductions. Novell will deliver on its promise of nearly two years ago to port Portable NetWare to IBM's OS/400 operating system on the AS/400 minicomputer.

IBM has taken on most of the responsibility for porting Portable NetWare to its RS/6000 Unix workstation line, Dzubeck said.

In addition, the two companies will introduce NetWare Loadable Modules (NLM) for IBM's MVS mainframe operating system, which will enable IBM mainframes to act as LAN servers.

Last month, Novell announced that IBM has joined Novell's Strategic Engineering Support program. That program will help IBM ensure that its products, including those in development, will be compatible with NetWare.

Despite IBM's relationship with Microsoft — IBM is a major customer of Microsoft's OS/2 LAN Manager, the base for IBM's LANServer — the computer maker has been one of Novell's largest customers, according to Novell officials. Although LANServer competes with NetWare, IBM offers NetWare through its education reseller channel.

"The only surprise is that it's taken so long for IBM to choose to enhance its relationship with Novell," Infonetics' Howard said.

Also at NetWorld, DEC said it plans to reaffirm its commitment to support NetWare, although DEC is not expected to unveil products supporting NetWare.

Instead, the company will detail plans to include Novell's IPX protocol stack in its PathWorks server software as the means of providing NetWare support, according to sources who requested anonymity. However, IPX support is not expected to be available in the near future.

DEC officials have said in the past that the company will embrace NetWare more closely. However, its NetWorld announcement will not include "the whole ball of wax" for NetWare integration, said Robert Nusbaum, DEC's integrated personal computing strategic marketing manager. Instead, DEC's NetWorld announcements will focus on the introduction of the company's long-anticipated token-ring products.

The TokenWorks product line, which will include a token-ring-to-Ethernet bridge and a token-ring interface card for DEC's Q-bus VAXes, will enable DEC's PathWorks client/server software to run on token-ring LANs.

Bankers Trust Co., a large VAX

site with nearly 100 token-ring LANs running NetWare, is anxiously awaiting such products, said Sholom Bryski, a vice-president at Bankers Trust.

"Anything that can be done to bridge those environments is important," he said. "We're struggling now with those issues."

DEC is also expected to release an update of the PathWorks software next month, according to John Logan, executive vice-president of the Aberdeen Group, a Boston-based market research firm. That release will add support for Microsoft Windows 3.0, he said, and will include support for the Transmission Control Protocol/Internet Protocol.

### Novell's net management

In addition to forging strategic alliances with major systems vendors, Novell will use NetWorld to boost its network management capabilities and begin addressing enterprise management issues that have been beyond the company's traditional LAN realm.

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**I**n addition to forging alliances, Novell will use NetWorld to boost its net management.

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"Novell is thinking very much in terms of the big picture," said Mark Freund, president of Interconnect Network Consulting Group, Inc., a Santa Monica, Calif.-based consultancy.

"Novell's progress in network management has much more depth" than Novell's previous net management scheme, he said. "It's their most advanced and well-thought-through strategy, and there are products in the works to support it."

A key component of Novell's improved network management will be a NetWare interface to IBM's NetView host-based net management software.

Novell has also signed a joint marketing agreement with Network Computing, Inc. (NCI) of Dallas, under which Novell will offer NCI's LANAlert Network Management System through its NetWare distribution channels.

LANAlert monitors the status of NetWare LANs and keeps track of the condition of NetWare server systems. The LANAlert architecture will facilitate Novell's development of a NetView interface for NetWare, according to John Ferrick, NCI's president.

DEC's DECmcc Director network management station will also gain access to NetWare LANs through an interface to NCI's LANAlert (see "DEC's net mgmt. scheme gains NetWare LAN access," page 15). **■**

## Microsoft unveils plans

*continued from page 2*

mid-range, characterized by graphics-based systems where customers will use Microsoft Windows on top of DOS; and the high end, where OS/2 and Unix will be the underlying operating systems for more sophisticated client/server applications.

Microsoft, Muglia said, will concentrate on the mid-range and high-end markets. The first products to come from these efforts will be DOS Version 5.0, to be released this year, and OS/2 Version 3.0, for which Microsoft has not specified a time frame.

Microsoft also said it is working on a Windows application program interface (API) for programs running on machines with a 32-bit architecture. The API, Windows-32, will be included in a future version of Windows.

The new specification will be designed to take advantage of machines based on the Intel Corp. 80486 microprocessor, which is optimized for 32-bit programs. According to Muglia, Windows-32 will provide more advanced graphics capabilities and will ease application development by including multitasking capabilities in its kernel.

The added support of and fo-

cus on Microsoft Windows puts a cloud of doubt over Microsoft's plans to continue supporting IBM's Presentation Manager graphical users interface.

Before last week, Microsoft supported application development equally under Presentation Manager and Microsoft Windows. "Microsoft is not dropping support of [Presentation Manager]; we're just focusing on Windows."

But analysts say all Microsoft is likely to do with Presentation Manager is support it. The company will no longer work to enhance the interface with IBM.

### The whole truth

Analysts do not think Microsoft is telling the whole truth. Katherine Barrett, network services division manager at Ernst & Young's Network Strategies in Fairfax, Va., not only questioned Microsoft's claims of continued Presentation Manager support, she said she doubted that Microsoft would continue supporting OS/2. "Don't believe them," she said. "I still think they're going to drop OS/2. And they've already dropped Presentation Manager."

According to David Terrie, president of Newport Consulting in Scituate, Mass., "Presentation Manager doesn't bring anything to the party." He said that supporting both environments is ul-

timately harder on the developer.

"The bottom line for the developers is: The same code doesn't transfer from [Microsoft Windows] to [Presentation Manager]," Terrie said. Therefore, applications developed under one cannot automatically run under the other.

Even Microsoft engineers seemed less than enthusiastic about Presentation Manager. "Users said they want Windows to be the common interface. It's not that we're going away from OS/2, but we're stressing Windows as an API," said Michael Riley, corporate networks system engineer for Microsoft, at Communication Networks '91 in Washington, D.C.

The company that could be hurt the most from Microsoft's abandonment of Presentation Manager is IBM. Big Blue's OfficeVision office computing environment, though not yet available, is based on a combination of OS/2 and Presentation Manager.

Microsoft's Muglia suggested that OfficeVision might boost sales of OS/2. But analysts said Microsoft's enhanced Microsoft Windows focus will more likely hurt OfficeVision sales.

This scenario may change, however, as IBM has talked about supporting Microsoft Windows clients in OfficeVision. **■**



## Fate of Tariff 12 on broader issue

*continued from page 2*

Also last week, FCC Commissioner Sherrie Marshall said at the Communication Networks '91 (ComNet) conference here that the FCC is changing its approach to conducting a broader proceeding on AT&T's status in the marketplace.

In that dominance proceeding, the agency is proposing dramatically reducing regulatory constraints on AT&T, which could eliminate the need for Tariff 12.

Marshall added that the agency has decided to pull apart the dominance proceeding and deal first with issues related to Tariff 12. "I expect to move forward in late spring or early summer on some of the specific proposals in our [dominance proceeding] notice. I think we're under the most pressure to do something in the high-end market," she said.

"The Tariff 12 [investigation] has added a sense of urgency to our broader proceeding," Marshall said. "I don't want to suggest that they will be combined into one track, but it has been im-

pressed upon us that there are large business user questions in that proceeding."

In particular, two changes proposed in the dominance proceeding might eliminate the need for Tariff 12.

The FCC is considering allowing AT&T to provide services to users under contract, with only a contract summary, rather than a tariff being filed with the agency.

That would shorten the

Marshall's comments for the first time linked Tariff 12 to that proceeding publicly.

Until now, the FCC has not discussed the two proceedings in conjunction with each other, although observers have speculated privately that AT&T may see the dominance proceeding as a fallback should the FCC fail to find Tariff 12 deals legal. Even if the FCC approves Tariff 12, some speculate that AT&T may try to

**"Tariff 12 has added a sense of urgency to our broader proceeding," Marshall said.**

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lengthy tariffing process that custom network users now must go through.

The other change would allow AT&T to withdraw some of its network facilities from the public domain, establishing a sub-network free of FCC oversight. This would enable AT&T to negotiate private deals with any rate terms and conditions.

migrate users away from the tariffed deals.

William Catucci, vice-president of federal regulatory affairs at AT&T, said he is not surprised the FCC has decided to take a phased approach to the dominance proceeding.

"I don't think anybody expected the FCC to do everything in one bite," he said.

Catucci said he believes the FCC will find Tariff 12 legal and downplay any significant connection with the dominance proceeding. However, he said that if the FCC decides the market is competitive and AT&T regulation should be relaxed, it would complement Tariff 12. He denies that AT&T would try to push users away from Tariff 12 deals. AT&T views contract carriage and private carriage as two more options for users, he added.

"Some users like the Tariff 12 concept because they can see what's out there and get the same sort of deal," Catucci said. But he added, "It seems to me that if a customer could have a contract [deal rather than Tariff 12], they would probably opt for that."

Marshall's remarks at ComNet were the first indication that the FCC is shifting its approach to resolving competition questions in the industry.

In March, the FCC decided to open the dominance proceeding in order to conduct a comprehensive examination of the long-distance marketplace and determine the appropriate level of regulation for AT&T in a number of areas. □

## Users build client/server future

*continued from page 1*

established by IBM in 1987 for building applications that interoperate and are portable across IBM hardware platforms. The guidelines outline standard communications and data base access methods, user interfaces and programming tools to be used in building such applications.

Sievers said FKI adopted SAA shortly after it was announced, largely because its initial attempt at building a client/server-based customer service application was a failure. That application, which supported claims processing, was built on a multivendor platform. Whenever there was a problem — and there were many — it was difficult to determine whether the application, net operating system or other component was at the root, Sievers said. That gave rise to plenty of finger pointing among vendors.

After that, FKI shifted its development work to SAA. The firm developed a three-tiered client/server application to handle policy settlements, in which IBM Personal System/2 workstations linked in an IBM Token-Ring Network can access data on a local server or the host.

"One of the things we like about SAA is that we can get all our products from one vendor, so if there is a problem, we know exactly where to go," Sievers said.

In the past, all customer service applications, with the exception of the claims processing system, were mainframe-based. That environment limited the amount of information that

agents were able to provide policyholders over the phone.

Agents had to submit customer queries for processing in batch mode overnight. Now agents can immediately answer callers' questions over the phone. When agents receive a call, they download the customer's file from the mainframe. If callers want to know how changes in their FKI policies might affect their premiums, agents can run one of a variety of applications on the workstation to answer their questions.

Besides helping to improve customer service, Siever said SAA has enabled FKI to make better use of its programming staff.

Because SAA applications can be ported to different hardware platforms, FKI can now assign one group of programmers to maintain a single application. Previously, FKI had to assign one group of programmers to maintain one application on the mainframe and another group to maintain the same application at the workstation level.

Another strong advocate of SAA is General Electric Capital Corp.'s Fleet Services. The firm embraced SAA in 1988 as it embarked on a \$20 million project to revamp its IS.

Fleet Services committed to SAA because it offered an optimal foundation on which to build cooperative processing applications for supporting key strategic areas, such as customer service, accident tracking and warranty recovery, said Larry Runge, director of advanced systems tech-

nology at Fleet Services in Eden Prairie, Minn.

Cooperative processing, which allows applications on multiple processors to work together to complete a task, would enable Fleet Services to off-load some processing chores from the mainframe to minicomputers and workstations.

This would not only give front-line personnel greater resources to solve and track problems, it would significantly decrease processing costs and reduce response time from three to four seconds to subsecond levels.

**Siever said SAA has enabled FKI to make better use of its programming staff.**

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"If we hadn't moved to cooperative processing, we wouldn't have embraced SAA as completely," Runge said.

Since 1988, Fleet Services has replaced its Honeywell, Inc. mainframe with seven interconnected token-rings supporting more than 600 IBM PS/2s and several IBM Application System/400 minicomputers.

The local networks, each of which supports an Intel Corp. 80386- or 80486-based file server, are connected to an IBM 3090 mainframe in Stamford, Conn., via a T-1 link.

The firm has rewritten many of its host-based applications as cooperative processing applications based on SAA.

In this new setup, a customer service application running on a local server or client workstation can establish an IBM LU 6.2 peer-to-peer link with applications running on other processors, including host data bases.

"Cooperative processing is much more efficient because machines are talking directly to machines instead of through layers of software," Runge said.

For the state of Alabama, committing to SAA was a way to more fully exploit the potential of its IS, said Raymond Well, director of the state's IS task force.

By rewriting financial and accounting systems as cooperative processing applications under SAA, Wells said the state can eliminate the use of paper and increase worker productivity by a factor of 10.

The state has built a 100M bit/sec Fiber Distributed Data Interface backbone linking more than a dozen token-ring networks in state offices in Montgomery, Ala. It is also replacing dumb terminals with workstations.

The FDDI backbone is needed to support the movement of much larger blocks of data between systems in cooperative processing. The applications will run primarily on client workstations and will access data on hosts, Wells said.

"Using cooperative processing systems and object-oriented applications, we can achieve substantial cost savings," Wells said. "But it allows our business to run more efficiently." □

## Users mixed on frame relay

*continued from page 6*

stitute (ICI) here, said his firm is not ready for frame relay.

"We haven't tapped all the capabilities of X.25 yet. I wouldn't be able to cost-justify [frame relay]," he said.

ICI provides analytical reports and maintains historical sales data for companies that sell mutual funds. Those companies tap into ICI's host from personal computers over a packet network provided by Sprint Data Group.

John Bischoff, manager of telecommunications planning for American President Systems, Ltd., in Oakland, Calif., said he's exploring frame relay to support local-area internetworking.

"We don't have a lot of LANs now, but the distributed architecture we are moving toward will increasingly be based on LANs," he said.

Capital Holding Corp., an insurance holding company in Louisville, Ky., recently began trialing X.25 service as a replacement for private lines. Eric Schmall, director of telecommunications at the company, said, "At the speeds we're running, I don't think we need frame relay. But in the future, if each office has a LAN, what's to stop us then?" □

### NETWORK WORLD

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by Amy Berman

## Myron Krueger

Krueger, the father of artificial reality, claims the technology is more than the next best thing to being there; in many cases, it's even better.

In networking, the popular buzzword is "virtual," as in virtual network. In computing, the popular term has long been "artificial," as in artificial intelligence.

A new computing concept of potential interest to network users is called "artificial reality." According to Myron Krueger, the top specialist in the field and the man who coined the term, the application of artificial reality to networks may allow communications professionals to virtually feel as if they're in two places at the same time.

Simulators, such as those used by the U.S. Air Force to train fighter pilots, have been around for decades. But Krueger is considered the pioneer in computer recreations of environments. His work on simulations earned him a recent citation from *Life* magazine as one of the "100 most influential people of the century."

### Defining artificial reality

Just what is artificial reality? Krueger's 1983 book on the topic, *Artificial Reality*, describes interactive environments that respond to a person's movements through visual and auditory displays. Krueger's artificial reality environment, dubbed VideoPlace, is a hybrid of computer technology, video and networking. In a common example of a training simulation, a computer-linked video camera conveys an image of a user's entire body to a computer screen, allowing the user to interact with rapidly changing graphical images and other users.

The images change as if they contain physical objects. For instance, if the user image touches a graphical representation of a ball, the ball rolls as if it were nudged.

For today's network administrators, Krueger's vision has many potential applications — from full utilization of Integrated Services Digital Networks to cross-country troubleshooting of network management problems.

Artificial reality "wouldn't change the operation of the network," Krueger says, "except you'd have the additional information of the gesture along with the voice and data."

For example, two users in remote locations could send data to

each other over digital telephone lines. Then, using hand silhouettes superimposed over the on-screen information, the users could "point to features in the data as naturally as if they were



sitting together at the same table," Krueger says.

Therefore, artificial reality "becomes a natural application for ISDN because the visual image of the participants' hands could be conveyed at the same time as the voice, while the information being exchanged between the computers would go over the data line," says Krueger, whose company, Artificial Reality Corp., based in Vernon, Conn., consists of himself, an engineer and a part-time assistant.

In day-to-day operations, a remote network manager might communicate with a peer or a supervisor at a distant location about a particularly troublesome situation. Viewing a screen-based diagram of the net topology, the supervisor could point out suspected trouble spots.

"The technology is ideal for firms that do a lot of consultation, like law firms, or firms where engineers are based in different locations but frequently need to talk about a common drawing or text," Krueger says.

Military and space agencies have been among the earliest commercial backers of artificial reality. The National Aeronautics and Space Administration spent much of the mid-1980s investigating whether artificial reality

might someday help astronauts explore space, as well as aid earthbound technicians in manipulating robots stationed in space. NASA's interest enhanced the credibility of Krueger's own work and helped give rise to a rebirth in the field.

More recently, a half-dozen other potential customers, including Digital Equipment Corp., Eastman Kodak Co., Honeywell, Inc. and McDonnell Douglas Corp., have begun considering whether to step up to the plate. So far, they've asked for demonstrations and tangible information about using Krueger's version of artificial reality for undisclosed competitive applications, as well as more concrete matters such as simulated training.

Many of Krueger's growing number of competitors promote graphically intensive universes that offer an astounding level of physical detail. But Krueger notes that these systems typically require some \$300,000 worth of equipment and are notoriously slow; they can require as much as one-third of a second to capture a user's movement.

In contrast, VideoPlace renders a simpler image in one-tenth of that time.

Krueger objects strenuously to saddling users with cumbersome equipment such as fiber-optically linked data gloves, data glasses or top-to-bottom data suits. The idea of users needing at least 15 minutes to become accustomed to navigating a new environment in this gear defeats the purpose of an artificial reality, he contends.

Krueger is frequently contrasted with Jaron Lanier, the 30-year-old, dreadlock-wearing founder of Redwood City, Calif.-based VPL Research, Inc., who introduced his own version of a fully preprogrammed virtual reality about six years ago. Lanier possesses a marketing savvy that has brought unprecedented attention to the field. His company has sold several of its virtual

reality-inducing data gloves and eyeglass mechanisms to research centers, rock stars and entertainment conglomerates.

The difference in technology, Krueger says, is largely a matter of marketing. Lanier "wanted to find another word for the artificial reality I had already been working on," Krueger says.

### Speaking out

Krueger is receiving his share of the limelight as well. This past autumn, he received invitations to speak to various professional computer associations and artist groups in Asia, Latin America and Europe, as well as in several North American cities.

Krueger delivered the keynote address, "Shaping Cultural Consciousness with Artificial Reality," at the first annual conference on virtual reality, held Dec. 10 and 11 in San Francisco. In addition, he has lectured alongside Timothy Leary, who endorses the potential of artificial reality with the same kind of enthusiasm he once reserved for LSD.

But while Leary was promoting one kind of alternative reality in the 1960s, Krueger was investigating the potential of computer science. In 1960, he entered Dartmouth College in Hanover, N.H., where he received a bachelor's degree in mathematics.

While pursuing a doctorate in computer science at the University of Wisconsin at Madison, Krueger won his first arts grant, a \$10,000 award from the National Endowment for the Arts to develop VideoPlace.

After completing his doctorate, Krueger joined the Space Science and Engineering Center at Madison, where he helped refine the technology used to transmit satellite images of weather formations.

He joined the University of Connecticut's computer science faculty in 1978 and remained there through 1985. Along the way, he continued to refine the world's sole VideoPlace installation, which is now on view in the one-room Connecticut State Museum of Natural History in Storrs. Each week the exhibit attracts about 500 visitors.

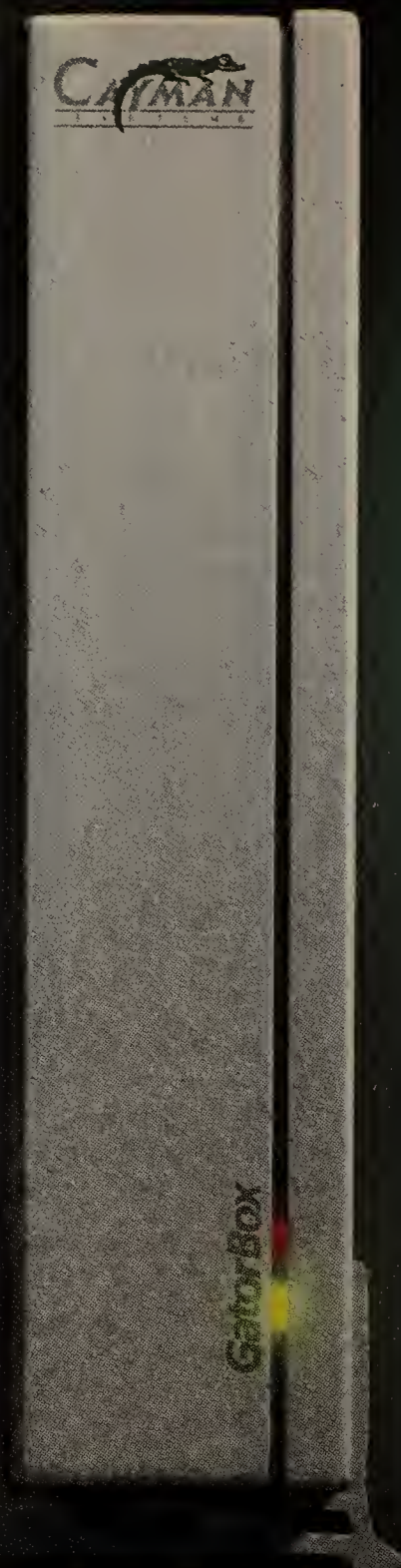
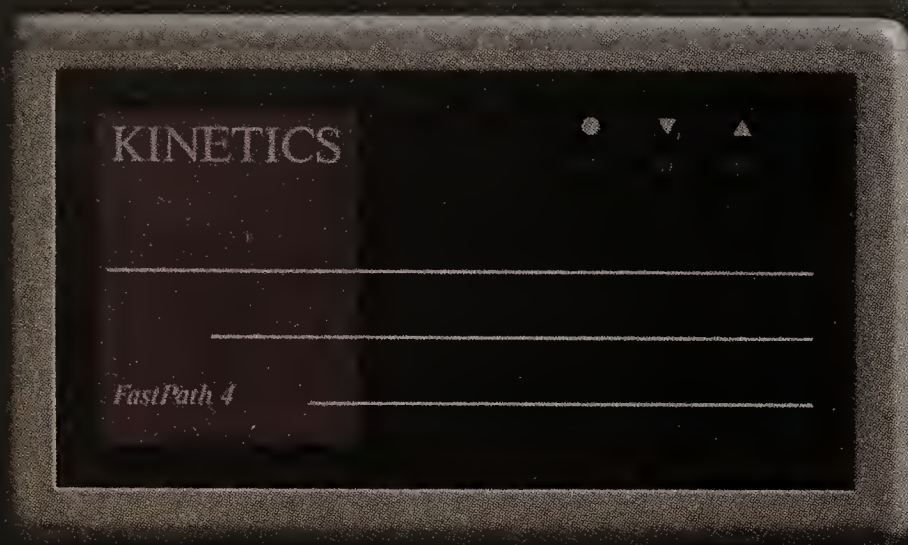
"I could get my technology to the desktop in a \$5,000 add-on board, once I develop a prototype," Krueger says.

In other words, by 1995, Krueger's artificial reality could be an actual reality. □

**For today's  
network  
administrators,  
Krueger's  
vision has  
many potential  
applications  
from full  
utilization  
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*Berman is a free-lance writer based in Boston.*





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